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ABSTRACT

This document contains the texts of 27 presentations given at the National Agricultural Education Research Meeting. The papers in the proceedings are grouped under 10 themes with a critique for each group. The themes (with speakers' names in parentheses) are as follows: supervised occupational experiences (Gregory W. Fletcher, David L. Williams, W. Wade Miller, John Slocombe, Fred Reneau, Rose Roider, Jim Legacy, and Tom Stitt, with a critique by John Hillison); agricultural mechanics institution (Joe Harper, J. David McCracken, Jack Rudolph, Roy Dillon, Glen C. Shinn, and David M. Agnew, critique by Gary E. Briers); characteristics of agricultural educators (*George Wardlow, Larry Miller, John Carnes, Donald R. Herring, J. David McCracken, and Lugard Etuk, critique by Alfred J. Mannebach); evaluation of vocational agriculture (Max B. McGhee, Howard Gordon, William Camp, and Larry R. Arrington, critique by Ronald A Brown); trends in agricultural education (James A. Knight, Ronald Rosati, Alan Kahler, and Thomas Curry, critique by Edgar P. Yoder and James H. Mortensen); vocational agriculture programs (Lane Beard, Michael Burnett, Susan Camp, Joe Kotrlik, Robert Martin, Emmanual Nwozuzu, and Amy Gleasson, critique by Ed Osborne); computer applications in instruction (Blannie Bowen, David M. Agnew, Norman Rohrbach, Bob Stewart, Art Berkey, and Dean Sutphin, critique by W. Wade Miller); teaching strategies (Jerry Peters, Joel Simmons, and James Mortensen, critique by R. Kirby Barrick); and issues in agricultural education (Ismail bin Yahya, Gary E. Moore, Dean Sutphin, Regina Smick, and Ron Seibel, critique by Gary W. Leske). Two additional papers on research methodology (Al Mannebach, Paul McKenna, and Geeta Pfau) and community development instruction (Kirby Barrick and Cheryl Caplinger) are also included. (KC)

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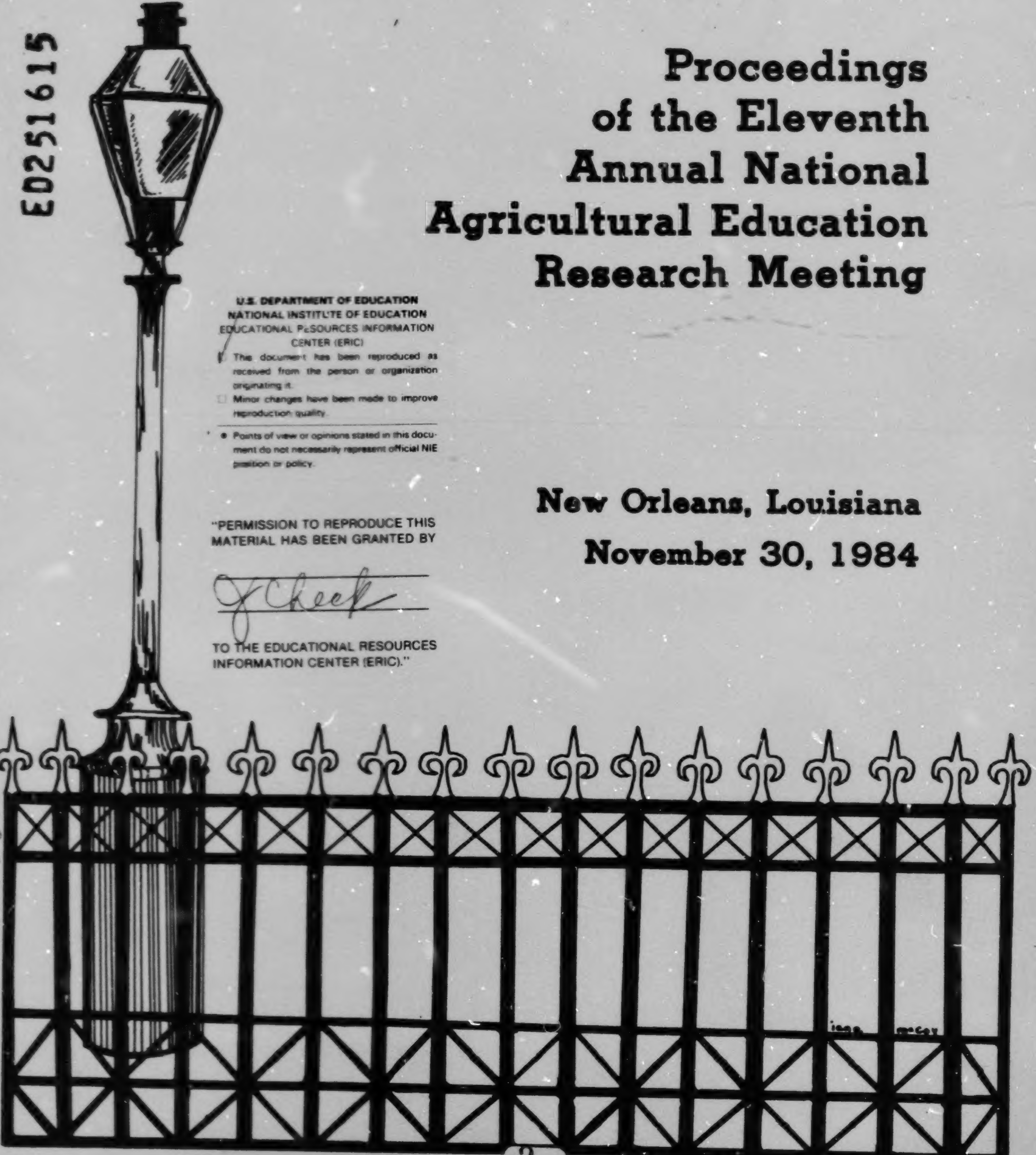
Proceedings of the Eleventh Annual National Agricultural Education Research Meeting



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New Orleans, Louisiana

November 30, 1984

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FOREWORD

Research is essential to progress in any profession. This is the basic tenet under which professionals in Agricultural Education launched the regional research conferences and, more recently, the National Research Meeting.

The National Agricultural Education Research Meeting (NAERM) is unique in its field; no other vocational service area has such a comprehensive meeting dedicated to research and featuring the best studies from across the nation. The 1984 NAERM is the eleventh in a distinguished series. Previous meetings were:

Number	Year	Location	Name and Institution of Chairperson
1	1974	New Orleans, LA	Hollie Thomas, Florida State
2	1975	Anaheim, CA	Hollie Thomas, Florida State
3	1976	Houston, TX	Glen Shinn, Mississippi State
4	1977	Atlantic City, NJ	William Richardson, Purdue
5	1978	Dallas, TX	Bennie Byler, Mississippi State
6	1979	Anaheim, CA	Ronald Brown, Mississippi State
7	1980	New Orleans, LA	L. H. Newcomb, Ohio State
8	1981	Atlanta, GA	Maynard Iverson, N. Carolina State
9	1982	St. Louis, MO	Dale Oliver, VPI & SU
10	1983	Anaheim, CA	Paul R. Vaughn, New Mexico State

The quality tone for the 1984 NAERM was set by those who conducted the previous meetings. I am grateful to a number of individuals who helped make this year's meeting successful: to Paul Vaughn, 1983 NAERM Chairman who provided an outstanding example to follow; to Al Mannebach, Chairperson, AVA Agricultural Education Division (AED) Research Committee whose assistance was essential in conducting the program and compiling these proceedings; to the members of the AVA/AED Research Committee for sponsoring and assisting in conducting the meeting; to Carl E. Beeman, Chairman, Department of Agricultural and Extension Education, University of Florida, for his support and encouragement in planning and conducting the conference; to a special anonymous friend who provided the Proceedings covers; to Bob Stewart, Chairperson Elect, NAERM, who coordinated the assembling of the Proceedings; to the Conference Secretary, Joe Townsend, who organized the conference registration; to Gary Moore, Program Chairperson, AVA/AED, who coordinated the overall program planning; to the participants in the program--chairpersons, facilitators, discussants and speakers--whose efforts resulted in an excellent conference; and to all members of the profession who submitted proposals and permitted their work to be judged by their peers. Twenty seven of the 67 proposals submitted were selected for a 40 percent acceptance rate. Thanks are also due to Lynne Kirkland and Diana Holder from the Department of Agricultural and Extension Education Department, University of Florida for their assistance in handling the volume of work associated with the 1984 meeting.

A special word of thanks is due the following individuals who served as referees and whose work provided the basis for the objective selection of presenters:

Art Berkey, Teacher Education, Cornell University
Gary Briers, Teacher Education, Texas A&M University
Ben Byler, Teacher Education, Mississippi State University
Lee Cole, Teacher Education, Oregon State University
Robert Cox, National FFA Alumni Association, Alexandria, Virginia
James Daniels, Teacher Education, Clemson University
Ivar Holmberg, Teacher Educator, University of Maryland
Alan Kahler, Teacher Education, Iowa State University
Jim Leising, Teacher Education, University of California
Dale Oliver, Teacher Educator, VPI and State University
Jerry Peters, Teacher Educator, Purdue University
Bill Richardson, Teacher Education, Louisiana State University
Myron Sonne, Teacher, Mitchell Vocational Technical School, South Dakota
Gary Varrella, Curriculum Specialist, University of California
Ed Yoder, Teacher Education, Pennsylvania State University

I hope that the papers from the 1984 NAERM will prove useful to all who receive them and that all presenters will submit their work for possible publication in a journal. It is time to begin preparing for the 1985 NAERM, and I hope that many of you will submit paper proposals for consideration to Dr. Bob Stewart, University of Missouri. Any suggestions you may have for improvement of future meetings will be appreciated.

Jimmy G. Cheek, Chairman
1984 National Agricultural
Education Research Meeting

ELEVENTH ANNUAL
NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETING

November 30, 1984
The New Orleans Marriott
New Orleans, Louisiana

Conference Chairperson: Jimmy G. Cheek, University of Florida
Chairperson Elect: Robert R. Stewart, University of Missouri
Conference Secretary: Joe D. Townsend, Texas A&M University

7:45-8:15am National Agricultural Education Research Meeting (NAERM)

-- Registration, Joe Townsend, Texas A&M University

8:15-8:30am NAERM First Session, Mardi Gras L & M

Chairperson: Jimmy G. Cheek, University of Florida

Facilitator: Larry Jewell, North Carolina State University

Topic: Orientation and Introductions

8:30-10:00am NAERM Second Session - Concurrent Session A, Mardi Gras K

Chairperson: James E. Christiansen, Texas A&M University

Facilitator: Coleen Kaczor, University of Illinois

Discussant: John Hillison, Virginia Polytechnic Institute and State University

Theme: Supervised Occupational Experiences

Topic I: Employers' Perceptions of Agribusiness Placement SOE Programs

Speakers: Gregory W. Fletcher, David L. Williams, and W. Wade Miller, Iowa State University

Topic II: Factors Influencing Student Participation and Perceptions of Supervised Occupational Experience Placement Programs

Speaker: John Slocombe, University of Idaho

Topic III: Attitudes of Vocational Agriculture Teachers Toward Supervised Occupational Experience Programs

Speaker: Fred Reneau, Rose Roider, Jim Legacy, Tom Stitt, Southern Illinois University

8:30-10:00am NAERM Second Session - Concurrent Session B, Mardi Gras J

Chairperson: Jeff Moss, North Carolina State University

Facilitator: Susan Everett, North Carolina State University

Discussant: Gary Briers, Texas A&M University

Theme: Agricultural Mechanics Instruction

Topic I: A Model of Variables Influencing Safety Attitudes of Agricultural Mechanics Students

Speakers: Joe Harper, University of Nevada, Reno
J. David McCracken, Ohio State University

Topic II: A Comparison of Existing Standards Found in Nebraska Seconary School Vocational Agriculture Mechanics Laboratories with Standards Developed on a National and Regional Level

Speakers: Jack Rudolph, Pennsylvania State University
Roy Dillon, University of Nebraska

Topic III: Frequency and Importance of Mechanical Activities Performed by Outstanding Young Farmers in Mississippi

Speakers: Glen C. Shinn, Mississippi State University
David M. Agnew, Montana State University

8:30-10:00am NAERM Second Session - Concurrent Session C, Mardi Gras I

Chairperson: Dennis Scanlon, Pennsylvania State University

Facilitator: Curt Paulson, Texas A&M University

Discussant: Alfred J. Mannebach, University of Connecticut

Theme: Characteristics of Agricultural Educators

Topic I: The Academic Ability of Agricultural Education Graduates Compared with Other Agriculture, Education and University Graduates

Speakers: George Wardlow, University of Minnesota
Larry Miller, Ohio State University

Topic II: Job Variables Related to Internal Motivation as Perceived by Persons Employed in Selected Professional Occupations in Agriculture

Speakers: John Carnes, Donald R. Herring, Texas A&M University

Topic III: Vocational Agriculture Teacher Commitment: A Correlational Analysis

Speakers: J. David McCracken, Ohio State University
Lugard Etuk, Cross River State (Nigeria)

10:00-10:15am NAERM Refreshment Break

10:15-11:45am NAERM Third Session - Concurrent Session D, Mardi Gras K

Chairperson: John R. Crunkilton, Virginia Polytechnic Institute and State University

Facilitator: Pete Driesbach, Texas A&M University

Discussant: Ronald Brown, Mississippi State University

Theme: Evaluation of Vocational Agriculture

Topic I: Assessment of Competencies Possessed by Students in the Fundamentals of Agribusiness and Natural Resources Occupations Program

Speakers: Max B. McGhee, University of Florida

Topic II: Analysis of the Occupational Attainment of Agricultural Education Graduates of the High School Class of 1972

Speakers: Howard Gordon, William Camp, Virginia Polytechnic Institute and State University

Topic III: Relationship of Occupational Status and Attitudes About Vocational Agriculture

Speaker: Larry R. Arrington, University of Florida

10:15-11:45am NAERM Third Session - Concurrent Session E, Mardi Gras J

Chairperson: Earl E. Russell, University of Illinois

Facilitator: Richard Tenney, Cornell University

Discussant: Ed Yoder, Pennsylvania State University

Theme: Trends in Agricultural Education

Topic I: A Content Analysis of *The Agricultural Education Magazine* 1929-1984

Speaker: James A. Knight, Ohio State University

Topic II: Administrators' Perceptions of National Issues in Agricultural Education

Speakers: Ronald Rosati, Alan Kahler, Iowa State University

Topic III: Identification of Professional Competencies Needed by Students in Agricultural Education Pursuing Agricultural Careers in Non-School Settings

Speaker: Thomas Curry, University of Florida

10:15-11:45am NAERM Third Session - Concurrent Session F, Mardi Gras I

Chairperson: J. Dale Oliver, Virginia Polytechnic Institute and State University

Facilitator: Rick Foster, University of Nebraska

Discussant: Ed Osborne, University of Illinois

Theme: Vocational Agriculture Programs

Topic I: Problems Encountered by Beginning Vocational Agriculture Teachers in Louisiana

Speakers: Lane Beard, Michael Burnett, Louisiana State University

Topic II: Summer Programs of Vocational Agriculture in the United States

Speakers: Susan Camp, Nevada State Department of Education
Joe Kotrlik, Louisiana State University

Topic III: Perceived Communications and Support Linkages of High School Principals and Vocational Agriculture Teachers

Speakers: Robert Martin, Emmanual Nwozuzu, and Amy Gleasson
Iowa State University

1:00-2:30pm NAERM Fourth Session - Concurrent Session G, Mardi Gras K

Chairperson: Lonell Moeller, South Dakota State University

Facilitator: Ray Herren, Oregon State University

Discussant: W. Wade Miller, Iowa State University

Theme: Computer Applications in Instruction

Topic I: Classroom Testing by Microcomputer: The Effect on Student Performance and Attitude Toward Computers

Speakers: Blannie Bowen, Mississippi State University
David M. Agnew, Montana State University

Topic II: Microcomputer Use in Teaching Graduate Students in Agricultural Education

Speakers: Norman Rohrbach, Bob Stewart, University of Missouri

Topic III: Microcomputer Use and Related Factors in New York State Among Agriculture Teachers, Post-Secondary Teachers, and Extension Agents

Speakers: Art Berkey, Dean Sutphin, Cornell University

1:00-2:30pm NAERM Fourth Session - Concurrent Session H, Mardi Gras J

Chairperson: William E. Drake, Cornell University

Facilitator: Mike Rush, Pennsylvania State University

Discussant: Kirby Barrick, Ohio State University

Theme: Teaching Strategies

Topic I: Student Reactions to Reflective Teaching: A Form of Laboratory Teaching Experience

Speaker: Jerry Peters, Purdue University

Topic II: The Effect of a Floral Merchandising and Design Record Book on Student Achievement

Speakers: Joel Simmons, James Mortensen, Pennsylvania State University

Topic III: Teacher and Student Reactions to Student Assisted Instruction: A Teaching Strategy for the Vocational Agriculture Classroom

Speaker: Jerry Peters, Purdue University

1:00-2:30pm NAERM Fourth Session - Concurrent Sesssion I, Mardi Gras I

Chairperson: Lee Cole, Oregon State University

Facilitator: Gilbert A. Long, Utah State University

Discussant: Gary Leske, University of Minnesota

Theme: Issues in Agricultural Education

Topic I: Improving Attitude-Related Measures in Agricultural Education Research: The Certainty of Response Rating Technique

Speakers: Ismail bin Yahya, Gary E. Moore, Louisiana State University

Topic II: Applications of Microcomputers and Need for Computer Competencies Development as Perceived by New York State Agricultural Secondary and Post-Secondary Instructors and Extension Agents

Speaker: Dean Sutphin, Cornell University

Topic III: Teacher Perception: FFA Membership with Non-Enrollment in Vocational Agriculture Courses

Speaker: Regina Smick, Ron Seibel, University of Maryland

2:30-2:45pm NAERM Refreshment Break

2:45-3:45pm NAERM Fifth Session, Mardi Gras L&M

Chairperson: Bob Stewart, University of Missouri

Facilitator: Jimmy G. Cheek, University of Florida

Theme: Improving Research in Agricultural Education

** Topic: Using Multiple Regression to Analyze Data in Agricultural Education Research

Speaker: J. Robert Warmbrod, Ohio State University

** Not included in the proceedings

Alternate Papers

Topic: An Analysis of Research Methodology Reported in Agricultural Education, 1974-1982

Author: Al Mannebach, Paul McKenna, Geeta Pfau, University of Connecticut

Topic: Community Development Instruction in Vocational Agriculture

Author: Kirby Barrick, Cheryl Caplinger, Ohio State University

THEME: SUPERVISED OCCUPATIONAL EXPERIENCES

EMPLOYERS' PERCEPTIONS OF AGRIBUSINESS PLACEMENT SOE PROGRAMS

Gregory W. Fletcher — Research Assistant
David L. Williams — Professor
W. Wade Miller — Asst. Professor

Iowa State University
Ames, Iowa

INTRODUCTION

Educators have long recognized supervised occupational experience (SOE) as a means of providing students with practical experiences in agriculture. Traditionally, vocational agriculture (vo-ag) students have completed production agriculture projects or have been placed on farms to gain occupational experience. By 1966, some states were expanding the concept of supervised occupational experience. In a document published by the Department of Agricultural Education (1966) at Montana State University emphasis was placed on:

> The . . . need for training experiences in off-farm agricultural occupations as expressed in the Vocational Education Act of 1963 has resulted in the extension of the placement-for-experience phase of the program to include the placement of students in agricultural businesses and industries (Department of Agricultural Education, 1966, p. 23).

SOE is a teaching-learning method that is considered an integral part of the vocational agriculture program. SOE provides students with practical learning in real-life work settings. It promotes the educational development of each student through actual job experiences on a farm or in an off-farm agricultural business. SOE programs that include placement for part-time employment in an agribusiness provides students with practical training in varied types of businesses.

Phipps (1980) emphasized the need for a broad experience program:

> A supervised occupational experience program should be of sufficient scope and should be conducted in such a way as to make it practical, interesting, challenging, and educational (Phipps, 1980, p. 218).

Supervised Occupational Experience was defined in a publication of the National FFA Foundation (Supervised Occupational Experience Handbook, 1982):

> Supervised Occupational Experience consists of all the planned practical activities conducted outside of scheduled class time in which the student develops and applies agricultural knowledge and skills.

> Students in SOE are supervised by teachers, parents, employers or adults who assist them in achieving their educational objectives. The competencies to be developed should be determined cooperatively by the student, teacher, parents and employer (Supervised Occupational Experience Handbook, 1982, p. 3).

Phipps (1980) identified the parties involved when he defined SOE as activities of educational value conducted by students outside of class in which teachers, employers, and parents provide instruction and supervision. When students are placed in agribusiness and on farms for employment experiences, the employer becomes a vital contributor to the educational process. Therefore, involvement of employers is essential to the success of SOE programs that involve placement for employment experiences.

PURPOSE AND OBJECTIVES

The problem of this research (Fle[illegible]r, 1983) was to determine the benefits derived from agribusiness SOE and to identify factors important in planning and/or conducting students' agribusiness employment experiences as perceived by employers of vocational agriculture students. More specifically, the objectives of the study were to:

1. Identify the benefits students derive for agribusiness placement SOE as perceived by employers.

2. Identify factors employers perceive as important in planning and/or conducting agribusiness placement SOE programs.

3. Determine if significant differences exist among employers on perceived benefits students receive from agribusiness placement SOE and on factors viewed as important in planning and/or conducting agribusiness employment experiences for vocational agriculture students when grouped according to type of business and person primarily responsible for supervision.

PROCEDURES

The population for this study consisted of agribusiness SOE employers of high school junior and senior students who were enrolled in selected Iowa vocational agriculture departments and who participated in agribusiness placement SOE programs during the fall of the 1981-82 school year. The selected Iowa vocational agriculture departments were chosen of the basis of schools having a total of at least six junior and/or senior students participating in an agribusiness placement SOE program. Students were chosen after teachers agreed to administer the student instrument as a part of the regular classroom curriculum. Teachers of the 22 schools meeting the stated population criterion were contacted by letter and instructed to give on a response form the initials of every odd numbered junior and/or senior student on the class roster who were participating in an agribusiness placement SOE program. This procedure produced a sampling of 150 students. A companion study (Pilgrim, 1983) collected data from these students. The information collected included the names, addresses, and phone numbers of the businesses where the students were employed. Students who were employed on farms and students who did not supply complete information about their employment were excluded from the study. As a result, the sample for this study included 56 non-farm agribusiness employers identified by the participating students. These employers were mailed questionnaires and asked to participate in the study. They were instructed to ask the person primarily responsible for the supervision of the the part-time vocational agriculture student(s) to complete the questionnaire.

The questionnaire used in this descriptive survey consisted of three parts. Part I asked employers to indicate on a nine-point scale the contribution they perceived that students' agribusiness SOE made to skill development (1 = no contribution, 5 = average contribution, and 9 = great contribution). Part II of the questionnaire asked employers to indicate on a nine-point scale how important selected factors were in planning and conducting students' agribusiness employment in SOE (1 = no importance, 5 = average importance, and 9 = great importance). The 35 occupational abilities included in Part I and the 17 selected factors in Part II were drawn from a review of literature. Part III asked employers to provide specific information about their company and their involvement with agribusiness SOE programs. The instrument items were reviewed for clarity and appropriateness by faculty and graduate students in the Department of Agricultural Education at Iowa State University. Suggestions made were incorporated into the final instrument. The reliability coefficients (Guttman's split half procedure) ranged from .80 to .87 for the scales.

After the initial mailing and two follow-up mailings 31 (55.4%) of the instruments had been returned, but only 29 (51.8%) were properly completed and usable. Since the percentage of returns was somewhat low, 9 (16.1%) of the non-respondents were randomly selected for further study. Each employer was telephoned and asked to respond to three randomly selected abilities from Part I and two randomly selected factors from Part II of the instrument. The t-test was utilized to determine if significant differences existed between the responses of the respondents and non-respondents. No significant differences were found at the .05 level; therefore, it was concluded that observations of the respondents could be generalized to the population of employers.

RESULTS

It was observed that the four most common functions of the agribusinesses serving as experience sites were: agriculture equipment sales and service (25.0%), agriculture supplies (25.0%), veterinary service (17.9%), and processing and distribution (17.9%). Almost 75 percent of the companies employed ten or less full-time employees. A majority (68.5%) had employed only one or two students over a two year period. More than half (57.7%) of the students were supervised by the manager or owner-manager of the business while the remainder (42.3%) were supervised by a foreman or department supervisor.

Development of Occupational Abilities

Employers were asked to rate the contribution of agribusiness employment experiences in developing 35 selected abilities in students. As shown in Table 1, 29 abilities were rated above average, indicating that the employers perceived agribusiness employment experiences as contributing to the development of occupational abilities. The five abilities rated highest were: (1) learn from the experiences of others, (2) use equipment in an agribusiness job, (3) use time efficiently, (4) identify skills needed in agribusiness jobs, and (5) establish and maintain businesslike relationships with others.

Insert Table 1 about here.

The businesses were divided into two groups, those providing services only (n=8) and those providing both sales and services (n=20). Using the t-test, only four significant differences for the 35 rated abilities were found between the groups at the .05 level. These four abilities were: (1) establish a set of values to guide their actions, (2) participate in the planning of their own activities, (3) use time efficiently, and (4) recognize and solve problems in an agribusiness job. In all four cases, the mean was higher for the sales and services businesses than for the service only businesses.

The business were also divided into two groups based on the position of the person primarily responsible for supervising the work of the part-time students. Supervision by the manager or owner-manager constituted one group (n=15) and the foreman or department supervisor, the second (n=11). Using the t-test, significant differences at the .05 level were observed for three abilities. These were: (1) read and understand agricultural information, (2) identify how agribusinesses are financed, and (3) use animal science information in an agribusiness job. All three of these abilities were rated significantly higher by the managers or owner-managers.

Factors in Planning and Conducting Agribusiness Placement SOE

Employers were asked to rate the importance of specific factors in planning and conducting vocational agriculture students' agribusiness employment experiences. Data in Table 2 reveal how employers rated the 16 factors. Fourteen of the 16 factors were rated above average in importance indicating that employers perceived these factors as important in planning and conducting agribusiness employment experience. The following five factors had the highest mean ratings: (1) the people in the agribusiness where students work, (2) students' parent(s) or guardian(s), (3) the agricultural experiences students had before starting their agribusiness employment, (4) the individualized coordination-teaching efforts by the vocational agriculture teacher, and (5) the evaluations of students' agribusiness experiences carried out by themselves, their vocational agriculture teacher(s), the employer, or others.

Insert Table 2 about here.

A t-test was utilized to determine if significant differences existed between the ratings of service only businesses (n=8) and sales and service businesses (n=20). Three differences were observed at the .05 level. The factors were: (1) the individualized coordination-teaching by the vocational agriculture teacher, (2) the supervisory visits made by the vocational agriculture teacher(s) to the agribusiness where students work, and (3) the records students kept on their agribusiness experiences. In each case, the mean was higher for the sales and service businesses than for the service only businesses.

The responses of employers were divided into two groups according to the position of the person primarily responsible for supervising the work of part-time vocational agriculture students. Supervision by the manager or owner-manager was one group (n=15) and the foreman or department supervisor was the second group (n=11). The results of the t-tests indicated that there was only one significant difference at the .05 level: foremen or department supervisors rated "the supervisory visits made by the vocational agriculture teacher(s) to the agribusiness where students work" significantly higher than managers or owner-managers.

RECOMMENDATIONS

The findings of this research revealed that employers perceived agribusiness employment experience as being valuable to students. The employers also rated a number of factors as being important in planning and conducting agribusiness employment experiences. The following recommendations are made to personnel responsible for administering and coordinating local vocational agriculture programs and agribusiness placement SOE programs.

1. Employers feel that agribusiness employment experience assists students in developing a variety of employment related abilities. Vocational agriculture teachers should make students, parents, and other interested persons aware of the benefits of agribusiness placement SOE.

2. Once an agribusiness employer indicates a willingness to serve as a cooperating employer for an agribusiness placement SOE program, the vocational agriculture teacher should provide information about the role the employer plays in the education of the student.

3. When planning the vocational agriculture curriculum, teachers should be aware of the occupational abilities that may be developed through agribusiness placement SOE.

4. Employers rated 14 factors as being of average to above average in

importance in planning and conducting agribusiness employment experiences. Teachers and other curriculum planners can use this list of important factors to help insure quality agribusiness placement SOE programs.

5. One of the important factors as perceived by employers was the individualized coordination-teaching efforts of teachers. On-site instruction and advice by the teacher should be provided on a systematic basis.

REFERENCES

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Table 1. Contribution of agribusiness employment experiences in developing occupational abilities in students as perceived by employers.

Abilities[a]	Mean	S.D.
Use equipment in an agribusiness job	7.21	1.29
Learn from the experience of others	7.14	1.38
Use time efficiently	6.86	1.38
Recognize that agricultural practices are changing	6.86	1.98
Establish and maintain businesslike relationships with others	6.83	1.34
Identify skills needed in agribusiness jobs	6.83	1.81
Follow business policies and procedures	6.66	1.59
Maintain and use records and reports	6.57	1.83
Recognize their skills and interests in making employment plans	6.52	1.01
Follow written directions and rules	6.48	1.64
Recognize and solve problems in an agribusiness job	6.39	1.50
Maintain customer relations	6.36	2.15
Provide supplies or services to farmers	6.36	1.79
Apply and interview for a job	6.32	1.59
Recognize employment opportunities in agriculture	6.28	1.53
Participate in the planning of their own activities	6.28	1.81
Participate in activities and programs that improve agriculture	6.18	1.81
Determine opportunities for self-employment	6.14	1.63
Use information about occupations in making employment plans	6.14	1.43
Establish a set of values to guide their actions	6.10	1.57
Read and understand agricultural information	6.07	2.02
Earn extra money to stay in school	6.03	2.03
Identify and use new practices in agriculture	6.00	1.87
Use math skills in an agribusiness job	5.90	1.66
Earn extra money to help the family	5.86	2.26
Handle and process farm products	5.61	2.27
Explain the role of agriculture in our nation	5.10	1.86
Express ideas clearly when speaking	5.03	1.61
Use plant and soil science information in an agribusiness job	5.00	2.36
Identify how agribusinesses are financed	4.86	2.07
Use animal science information in an agribusiness job	4.82	2.47
Use services of agencies and organizations in securing a job	4.69	1.71
Manage an agribusiness	4.68	2.25
Express ideas clearly when writing	4.55	1.99
Participate in activities and programs that improve the community	4.52	1.77

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[a] Abilities are listed in rank order based on mean ratings.

Table 2. Importance of factors in planning and conducting vocational agriculture students' agribusiness employment experiences

Factors[a]	Mean	S.D.
The people in the agribusiness where students work	7.54	1.14
Students' parent(s) or guardian(s)	6.62	1.52
The agriculture experiences students had before starting their agribusiness employment	6.61	1.60
The individualized (one-to-one) coordination-teaching efforts by the vocational agriculture teacher	6.55	2.05
The evaluations of students' agribusiness experiences carried out by themselves, their teachers, employers, or others	6.36	1.97
High school classes (excluding vocational agriculture)	6.35	1.34
FFA chapter activities	6.24	1.92
The goals established for students' agribusiness experiences	6.21	1.32
Vocational agriculture classes	5.93	1.75
The training or experience plan(s) developed for the students' agribusiness experiences	5.90	1.54
The rules of the vo-ag department for agribusiness experiences	5.86	1.53
Fellow vocational agriculture students	5.68	1.57
Agreement(s) developed for students' agribusiness experiences	5.48	1.60
The supervisory visits made by the vo-ag teachers to the agribusiness where students work	5.00	2.36
The records students kept on their agribusiness experiences	4.89	2.17
Wages earned by students from their agribusiness experiences	4.89	1.81

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[a] Factors are listed in rank order based on mean ratings.

FACTORS INFLUENCING STUDENT PARTICIPATION AND PERCEPTIONS OF SUPERVISED OCCUPATIONAL EXPERIENCE PLACEMENT PROGRAMS

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INTRODUCTION

Supervised occupational experience (SOE) placement programs are an effective method for students to develop occupational abilities in agriculture (Mortensen, 1979; Kruckenberg, 1979; Fletcher, 1983; and Pilgrim, 1983). Student perceptions of these programs may be influenced by a variety of factors such as personal and situational characteristics, the vocational agriculture instructor, and the community. According to Fletcher (1983), Pilgrim (1983), and Williams (1983b), one way to improve student perceptions and participation in SOE placement programs is to provide preparatory instruction in the vocational agriculture class.

In an effort to provide materials for vocational agriculture instructors to use in providing preparatory instruction about SOE placement programs to vocational agriculture students, a SOE placement program instructional packet was developed at Iowa State University (Williams, 1983a). Slocombe and Williams (1983) used a posttest control group design to evaluate the effectiveness of the instructional packet by student knowledge of SOE placement programs, student attitude toward SOE placement programs, and SOE placement program planning (hereafter identified as dependent variables). Using these measures, they concluded the instructional packet did not enhance student preparation for participating in SOE placement programs.

Pilgrim (1983) and Pilgrim and Williams (1984) reported that students participating in SOE placement programs differ considerably from the "traditional" vocational agriculture student. However, the literature is almost void of research that describes these student differences and their relationship to SOE placement programs. Based on these findings, it was decided to reanalyze the Slocombe (1983) study to investigate which factors influenced the participation and perceptions of students in SOE placement programs. The outcomes of this research should be useful to vocational agriculture instructors in assisting students to plan and develop SOE placement programs.

PURPOSE AND OBJECTIVES

The purpose of this research was to determine the relationship of selected factors toward student participation and perceptions of SOE placement programs. The specific objectives were:

1. to identify personal and situational characteristics of sophomore vocational agriculture students in selected schools in central Iowa.
2. to identify professional and situational characteristics of vocational agriculture instructors in selected schools in central Iowa.

3. to determine if differences exist in student performance on the dependent variables when grouped by selected characteristics.
4. to determine if relationships exist among selected teacher characteristics and student performance on the dependent variables.

PROCEDURES

The population for this study consisted of sophomore vocational agriculture students and vocational agriculture instructors in the north central and south central vocational agriculture/FFA districts in Iowa during the 1982-83 school year. The randomly selected sample consisted of 322 students and 29 instructors.

Two instruments were used in collecting data for the study. One was designed to be completed by the students, and one was designed to be completed by the instructors. The development of the instruments is described in the following paragraphs.

The student instrument contained four parts.

Part I--SOE Placement Program Knowledge Inventory. A criterion referenced test of 24 multiple-choice items with four alternatives each was used to assess each student's knowledge of SOE placement programs. To insure content validity, the researcher evaluated the contents of the test based on the problem areas, study questions and learner needs outlined in the instructional packet (Williams, 1983a). To further refine the items and alternatives of the knowledge inventory, it was field tested with a class of sophomore vocational agriculture students in Story County, Iowa. The final instrument consisted of eight items pertaining to each of the three problem areas of the instructional packet. The knowledge inventory yielded a reliability coefficient (Cronbach's alpha) of .698. The inventory was scored and reported on a percentage basis.

Part II--SOE Placement Program Attitude Inventory. To measure each student's attitude toward SOE placement programs, an attitude inventory utilizing the semantic differential technique was developed. Research conducted by Kotrlik (1978), McMillion (1966),Birkenholz (1982), and Hosseini (1982) reported success with the semantic differential technique with vocational agriculture students. The instrument consisted of six broad attitudinal concepts, two from each problem area of the SOE placement program instructional packet (Williams, 1983a), with six seven-step scales bound by appropriate bipolar adjectives. The bipolar adjectives were taken from those recommended by Osgood, et al. (1971), the originators of the semantic differential technique. To insure content validity, the researcher selected the bipolar adjectives based on the dimension of meaning they represented and their appropriateness for the concept being measured. Then, the instrument was evaluated by teacher educators in the Department of Agricultural Education at Iowa State University. The attitude inventory was further refined through a field test with a class of sophomore vocational agriculture students in Story County, Iowa. The concepts and bipolar adjectives were randomly arranged on the instrument.

Factor analytic techniques revealed that six distinguishable concepts were being measured by the instrument. In addition, intercorrelations among subscales were positive and homogeneous. The attitude inventory yielded a reliability coefficient (Cronbach's alpha) of .948. These findings supported the procedure used in computing a summative attitude score.

Part III--SOE Placement Program Planning Inventory. This inventory was developed to assess the degree to which students had selected and planned their individual SOE placement program. Each of 14 statements describing a SOE placement program planning activity was weighted on a 1 to 9 importance scale by a jury of teacher educators as an indicator of good SOE placement program planning. Then, questions that elicited yes or no responses from the students were developed based on the original statements. The inventory yielded a reliability coefficient (Cronbach's alpha) of .711. A summative score was produced by adding the weighted values (jurors' mean importance scores) for yes responses of each student. Inventory scores were reported on a percentage basis.

Part IV--Student Data Questionnaire. This instrument was designed to collect student personal and situational data. The response framework consisted of multiple choice, dichotomous, and completion type responses.

The instructor instrument was designed to collect teacher professional and vocational agriculture department data. The response framework consisted of multiple choice, dichotomous, and completion type responses.

The vocational agriculture instructors administered the data collection instruments. Usable data were obtained from 322 students and 29 instructors, a 100 percent response rate.

Percentages were used to determine personal and situational data. One-way analysis of variance was used to test for differences among students' performance on the dependent variables when grouped by selected characteristics. The Duncan post hoc test was used to identify differences between all possible pairs of group means. Pearson product-moment coefficients of correlation were computed to determine if relationships existed among selected instructor characteristics and student performance on the dependent variables. The direction of the correlation was not hypothesized; therefore, a two-tail test of statistical significance was performed. The .05 alpha level was used.

RESULTS

The results will be closely tied to the research objectives. Table 1 shows the characteristics and situations of the 322 sophomore vocational agriculture students in selected schools in central Iowa during the 1982-83 school year. Twenty-four percent of the students lived in a city or town. Similarly, 28 percent of the students were involved with SOE placement programs and 50 percent were interested in obtaining employment experience in off-farm agricultural occupations before high school graduation. Almost equal numbers of students indicated a strong interest in pursuing production agriculture and off-farm agricultural occupations upon completion of their formal education. Finally, 65 percent of the students planned to obtain post-secondary education after high school graduation.

Table 2 shows the characteristics and situations of the 29 vocational agriculture instructors in central Iowa during the 1982-83 school year. On the average, vocational agriculture instructors had taught for 9.7 years; 7.9 years in the present school district. Sixty-six percent of the instructors averaged 30 months of work experience in agribusiness occupations. Two-thirds had completed a college course about SOE placement programs. Therefore, most of the instructors should have been familiar with the procedures used in conducting SOE placement programs.

The average number of students enrolled in vocational agriculture was 43.77, with an average of 17.55 students engaged in SOE placement programs. Normally, instructors spent 8.25 days teaching students about SOE placement programs; this year they spent an average of 11.14 days.

Table 1. Characteristics and Situations of Sophomore Vocational Agriculture Students in Central Iowa, 1982-83

Characteristic or Situation	Percentage*
Place of residence	
City or town	24
Rural area, not a farm	12
On a farm	64
Type of present SOE	
Animals and/or crops	58
Farm placement	16
Agribusiness placement	8
Laboratory - school facilities	4
None	14
Preferred employment experience before graduating from high school	
Production agriculture	50
Agricultural mechanics	19
Forestry	1
Horticulture	1
Agricultural sales and service	6
Agricultural processing	4
Natural resources	10
Other	2
Non-agriculture	7
Occupational Plans	
Production agriculture	38
Off-farm agriculture	33
Non-agriculture	11
Undecided	18
Attend a vocational school, college, or university after high school graduation	
Yes	65
No	35

*n = 322 students from random sample of 29 schools

Table 2. Characteristics and Situations of Vocational Agriculture Instructors in Central Iowa, 1982-83

Characteristic or Situation	$\bar{X}$*
Years taught vocational agriculture	
Total	9.71
In present school	7.87
Months agribusiness experience	30.00
Number of students enrolled	43.77
Number of students with SOE placement programs	17.55
Days spent teaching about SOE placement	
Normally	8.25
This year	11.14

*n = 29 vocational agriculture instructors

To determine if differences existed between the three dependent variables and student characteristics, the single classification analysis of variance was employed. The student characteristics included in the analysis were: (1) place of residence, (2) present type of SOE program, (3) employment experience preferred before high school graduation, (4) plans to attend a vocational school, college, or university, and (5) occupational plans upon completion of formal education.

Table 3 shows a significant difference existed between student knowledge score and location of residence. The highest score was obtained by students living on farms. Students living in a rural area, but not on a farm, obtained a score of 65.35, slightly less than the on-farm students. The lowest knowledge score was achieved by students living in a city or town. The post hoc test revealed the significant difference was between students living in a city or town and students living on a farm. No significant difference existed between the attitude scores and program planning scores of students in the three residence locations.

Table 3. Analysis of Dependent Variables by Location of Residence

Residence	Mean	S.D.	F-value
	Knowledge Score		
In a city or town	59.49	17.72	
In a rural area, not a farm	65.35	13.57	5.67**
On a farm	66.12	13.82	
Residence	Attitude Score		
In a city or town	5.55	.91	
In a rural area, not a farm	5.62	.81	.98
On a farm	5.70	.70	
Residence	Program Planning Score		
In a city or town	36.95	22.34	
In a rural area, not a farm	43.48	18.27	1.39
On a farm	37.86	20.60	

**$p < .01$

Table 4 shows that students with production SOE programs achieved the highest knowledge scores. The data reveal that students with other types of SOE programs tended to perform similarly on the SOE placement program knowledge inventory. An F-value of 3.11 (and the post hoc test) revealed a difference existed at the .01 alpha level between students with animals and crops for SOE programs and students with on-farm placement SOE programs.

Attitude scores of students in the six types of SOE programs exhibited very little variation. A non-significant F-value indicated student attitudes toward SOE placement programs were homogeneous regardless of their present type of SOE program. Students working in an off-farm agribusiness achieved the highest program planning score. A significant difference existed between program planning scores for students working in an off-farm agribusiness and students with no SOE program.

Table 4. Analysis of Dependent Variables by Present Type of SOE

Present Type of SOE	Mean	S.D.	F-value
	Knowledge Score		
Raising animals or crops	67.09	13.80	
Working on a farm, not home farm	59.05	14.45	
Working in off-farm agribusiness	62.17	17.26	3.11**
Working with school facilities	60.11	16.64	
Other	61.11	11.79	
None	62.47	17.94	
Present Type of SOE	Attitude Score		
Raising animals or crops	5.70	.73	
Working on a farm, not home farm	5.52	.83	
Working in off-farm agribusiness	5.64	.90	.61
Working with school facilities	5.59	.91	
Other	5.76	.64	
None	5.65	.73	
Present Type of SOE	Program Planning Score		
Raising animals or crops	37.46	20.07	
Working on a farm, not home farm	40.75	22.50	
Working in off-farm agribusiness	47.78	24.86	2.45*
Working with school facilities	44.33	19.78	
Other	35.28	18.57	
None	31.00	17.39	

*$p < .05$
**$p < .01$

There was only one significant difference between the dependent variables and employment preference before high school graduation. As shown in Table 5, the post hoc test indicated a highly significant difference existed in student attitude toward SOE placement programs between students wanting employment experience in production agriculture and students desiring employment experience in agricultural processing. On the other hand, no significant difference was found in student knowledge and program planning scores when students were grouped by employment experience preferred.

Table 5. Analysis of Student Attitude Toward SOE Placement Programs and Employment Experience Preferred Before High School Graduation

Occupational Area	Mean	S.D.	F-value
Production agriculture	5.75	.67	
Agricultural mechanics	5.62	.81	
Forestry	5.34	.58	
Horticulture	5.75	.67	
Agricultural sales and service	5.38	.75	3.73**
Agricultural processing	4.62	1.17	
Natural resources	5.71	.64	
Other agriculture	5.57	.81	
Non-agriculture	5.75	.94	

$^{**}p < .01$

One would suspect that students' knowledge, attitude, and program planning scores would be affected by formal education plans. Table 6 shows a highly significant difference in knowledge scores between students who planned to continue their formal education after high school graduation and those who did not. Surprisingly, these plans had very little effect upon the students' attitude and program planning scores.

Table 6. Analysis of Dependent Variables by Plans to Attend a Vocational School, College, or University After High School Graduation

Plan to Obtain Post-Secondary Education	Mean	S.D.	F-value
	Knowledge Score		
Yes	66.29	13.58	
No	61.04	16.92	9.11**
Plan to Obtain Post-Secondary Education	Attitude Score		
Yes	5.69	.71	
No	5.57	.85	2.03
Plan to Obtain Post-Secondary Education	Program Planning Score		
Yes	38.70	20.44	
No	37.58	21.53	.21

$^{**}p < .01$

The final comparison examined was the students' occupational plans with each dependent variable. As shown in Table 7, the post hoc test revealed that students planning to pursue employment in production agriculture achieved a significantly higher knowledge score than students undecided about their occupational plans. No significant difference was observed in attitude nor program planning scores when students were grouped according to occupational plans.

Table 7. Analysis of Dependent Variables by Occupational Plans of Students

Occupational Area	Mean	S.D.	F-value
	Knowledge Score		
Production agriculture	70.31	12.78	
Off-farm agriculture	65.79	15.25	2.11*
Non-agriculture	66.20	13.58	
Undecided	58.33	17.13	
Occupational Area	Attitude Score		
Production agriculture	5.98	.53	
Off-farm agriculture	5.68	.70	1.61
Non-agriculture	5.60	.95	
Undecided	5.38	.93	
Occupational Area	Program Planning Score		
Production agriculture	39.63	21.11	
Off-farm agriculture	39.11	21.10	.99
Non-agriculture	32.88	21.46	
Undecided	35.25	21.80	

*$p < .05$

Pearson product-moment coefficients of correlation were computed to determine relationships between selected instructor/school characteristics and student performance on the three dependent variables. In Table 8, four of the correlations between the teacher/school characteristics and knowledge score were positive; two were negative. The highest coefficients computed were between the knowledge score and: (1) number of days normally spent teaching sophomore students about SOE placement programs, and (2) number of days spent this year teaching sophomore students about SOE placement programs. These positive relationships indicate the more days teachers spent teaching about SOE placement programs, the higher the students scored on the knowledge test.

Table 8. Coefficients of Correlation Between Teacher/School Characteristics and the Dependent Variables

Characteristic	Knowledge Score	Attitude Score	Program Planning Score
Total years taught vo ag	-.024	.124	-.099
Number of students in vo ag	.163	.352	.013
Number of students with SOE placement	.146	.263	.146
Months agribusiness experience	-.147	.072	.091
Normal days SOE placement instruction	.219	.372*	.209
Number days SOE placement instruction this year	.271	.146	.226

$^*p < .05$

Comparison of the SOE placement program attitude score with teacher/school characteristics produced one significant, but relatively weak, correlation. As the days of instruction about SOE placement programs normally provided increased, the students' attitude score tended to increase. Five of the correlations between teacher/school characteristics and the SOE placement program planning scores were positive, however, relatively low.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this study, several conclusions and recommendations are relative to the sophomore vocational agriculture students in the north central and south central vocational agriculture/FFA districts in Iowa during the 1982-83 school year.

A trend throughout the findings was that students with a production agriculture background achieved higher scores on the dependent variables than other students. Students living on a farm, engaged in production SOE programs, wanting production agriculture employment experience, and with occupational plans in production agriculture possessed a more positive perception of SOE placement programs as revealed by the SOE placement program knowledge and attitude scores; however, these factors had an inverse effect on the participation of students in these programs. Students with off-farm SOE placement programs achieved significantly higher program planning scores than students involved in production agriculture. These findings suggest that students with a background in production agriculture may have more opportunities to develop occupational abilities and skills related to SOE placement programs than other students. Other students may require more time to develop an understanding and appreciation for SOE placement programs; in essence, they may have fewer opportunities to develop occupational abilities and skills because of situational characteristics. Vocational agriculture instructors should assist students with a background in production agriculture in developing a SOE placement program that will compliment their occupational objective. This could result in more positive student perceptions and participation in SOE placement programs.

A positive correlation existed between the amount of instruction students received about SOE placement programs and the SOE placement program knowledge and attitude scores. A positive relationship existed between student attitude and the number of students involved in SOE placement programs. These findings suggest that student perceptions about SOE placement programs are enhanced by the number of participating students. Additionally, vocational agriculture instructors should spend an adequate number of days teaching students about SOE placement programs. This could assist participating students to develop a more positive perception.

Finally, further research of other factors influencing student participation and perceptions of SOE placement programs should be conducted. An analysis of additional factors related to the students' personal and situational characteristics may be beneficial to vocational agriculture instructors in assisting students to plan and develop SOE placement programs.

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ATTITUDES OF VOCATIONAL AGRICULTURE TEACHERS TOWARD SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS

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INTRODUCTION

Supervised Occupational Experience Programs (SOEPs) provide students with opportunities to "learn by doing". Many educators, "throughout the United States have begun to question the quality, quantity and integral nature of the experimental component of vocational agriculture programs" (Leising, Wolfrom, and Zilbert, 1982, p. 8). Tulloch (1979) stated, "each agriculture educator must be convinced that supervised occupational experience programs are necessary for each student if we are to have outstanding vocational agriculture programs" (p. 282).

The quality and quantity of SOEPs in vocational agriculture must be of concern to agriculture educators. The attitude of the teacher is instrumental in how well any subject is presented and accepted by students (Giachino and Gallington, 1977). This study focused on vocational agriculture teachers attitudes toward SOEPs and the quantity of SOEPs.

Teachers have played an important role in students' acceptance and involvement with SOEP. Students who were encouraged to have SOEPs were more likely to have SOEPs. Therefore, students who were not encouraged lacked SOEPs. Lack of support for SOEPs was a significant problem (Taylor and McMillion, 1983).

PURPOSE AND OBJECTIVES

The primary purpose of this study was to determine vocational agriculture teachers attitudes toward SOEPs. A secondary purpose was to access the quantity of SOEPs by vocational agriculture program. The specific objectives were:

1. Determine the relationship between attitudes of vocational agriculture teachers toward SOEPs and number (quantity) of students with SOEPs in each vocational agriculture program.
2. Determine the difference in proportion of students with SOEPs taught by vocational agriculture teachers who had an SOEP in high school and the proportion of students with SOEPs taught by vocational agriculture teachers who did not have an SOEP in high school.
3. Determine the difference in the attitudes toward SOEPs of vocational agriculture teachers who had an SOEP in high school and attitudes of vocational agriculture teachers who did not have an SOEP in high school.

RESEARCH QUESTIONS

The objectives of the study were reflected in the following research questions:

1. Is there a relationship between attitudes of vocational agriculture teachers toward SOEPs and number (quantity) of students with

SOEPs in each vocational agriculture program?

2. Is there a difference in the proportion of students with SOEPs taught by vocational agriculture teachers who had an SOEP in high school and the proportion of students with SOEPs taught by vocational agriculture teachers who did not have SOEPs in high school?
3. Is there a difference in the attitudes toward SOEPs of vocational agriculture teachers who had an SOEP in high school and attitudes of vocational agriculture teachers who did not have an SOEP in high school?

PROCEDURES

Sample

The study population was comprised of 12,474 vocational agriculture teachers in the United States. The random sample for this study was 373 high school vocational agriculture teachers in the United States. The Agriculture Teachers Directory (Henry, 1983) was used to identify the random sample of vocational agriculture teachers. All fifty states were included in the study.

Instrumentation

An opinionnaire was developed to gather data. The opinionnaire was comprised of half positive and half negative statements (Best, 1981). The opinionnaire was reviewed by a panel of five experts (Williams, Sutphin, Townsend, Cone, Robb, 1984). The validity of the statements were evaluated by the panel following the criteria of Edwards (1957) to determine the clarity of the Likert-typed opinionnaire. Reliability was tested by administering the opinionnaire to eleven vocational agriculture teachers in District V. The reliability coefficient using the Kuder-Richardson formula 20 to measure internal consistency (Ferguson, 1976) was $r = .70$.

Instrumentation Administration

A cover letter and SOEP Opinionnaire was mailed to a random sample of vocational agriculture teachers in the United States. The packet also included a self-addressed, stamped envelope.

Null Hypotheses

The research questions of this study were restated in the null hypothesis form. The probability level was established at .05 with a ninety-five percent confidence level.

Ho1: There is no relationship between the attitudes of vocational agriculture teachers towards SOEPs and the quantity of SOEPs in each vocational agriculture program.

Ho2: There is no difference in the proportion of students with SOEPs taught by vocational agriculture teachers who had SOEPs in high school and the proportion of students with SOEPs taught by vocational agriculture teachers who did not have SOEPs in high school.

Ho3: There is no difference in the attitudes towards SOEPs of vocational agriculture teachers who had SOEPs in high school and the attitudes towards SOEPs of vocational agriculture teachers who did not have SOEPs in high school.

Data Treatment

Quantity values were computed by determining the proportion of vocational agriculture students having SOEPs in each vocational agriculture program. A one-to-five attitudinal rating value was assigned to the vocational agriculture teacher's scoring of each SOEP statement. An overall mean was formulated for the attitudinal rating of each teacher. A mean and standard deviation of the SOEP statements were computed for the sample. Null hypotheses one was tested using Pearson product-moment correlation. Hypotheses two and three were tested using analysis of variance.

RESULTS

Three hundred and five of the 373 random sample of vocational agriculture teachers completed and returned the SOEP opinionnaire. Two hundred and twenty-three vocational agriculture teachers had SOEPs as high school students while eighty-two vocational agriculture teachers did not have SOEPs as high school students.

The data were collected, compiled, and used in testing the null hypothesis. The analysis of the data to test the hypothesis consisted of Pearson product-moment correlation and one way analysis of variance.

Ho1: There is no relationship between the attitudes of vocational agriculture teachers toward SOEPs and the quantity of SOEPs.

A Pearson's Product Moment Correlation coefficient of $r = .59$, a positive correlation (Hinkle, Wiersma, and Jurs, 1982, p. 110) indicated there was a relationship between the teacher attitudes toward SOEPs and the number of students currently having SOEPS within the local vocational agriculture program (Figure 1). The overall vocational agriculture teachers SOEP attitudinal mean was 4.03 with a standard deviation of .51. The overall quantity value mean was .82 with a standard deviation of .22. Teachers who had a more positive attitude toward SOEPs had a greater proportion of students with SOEP. The null hypothesis was rejected.

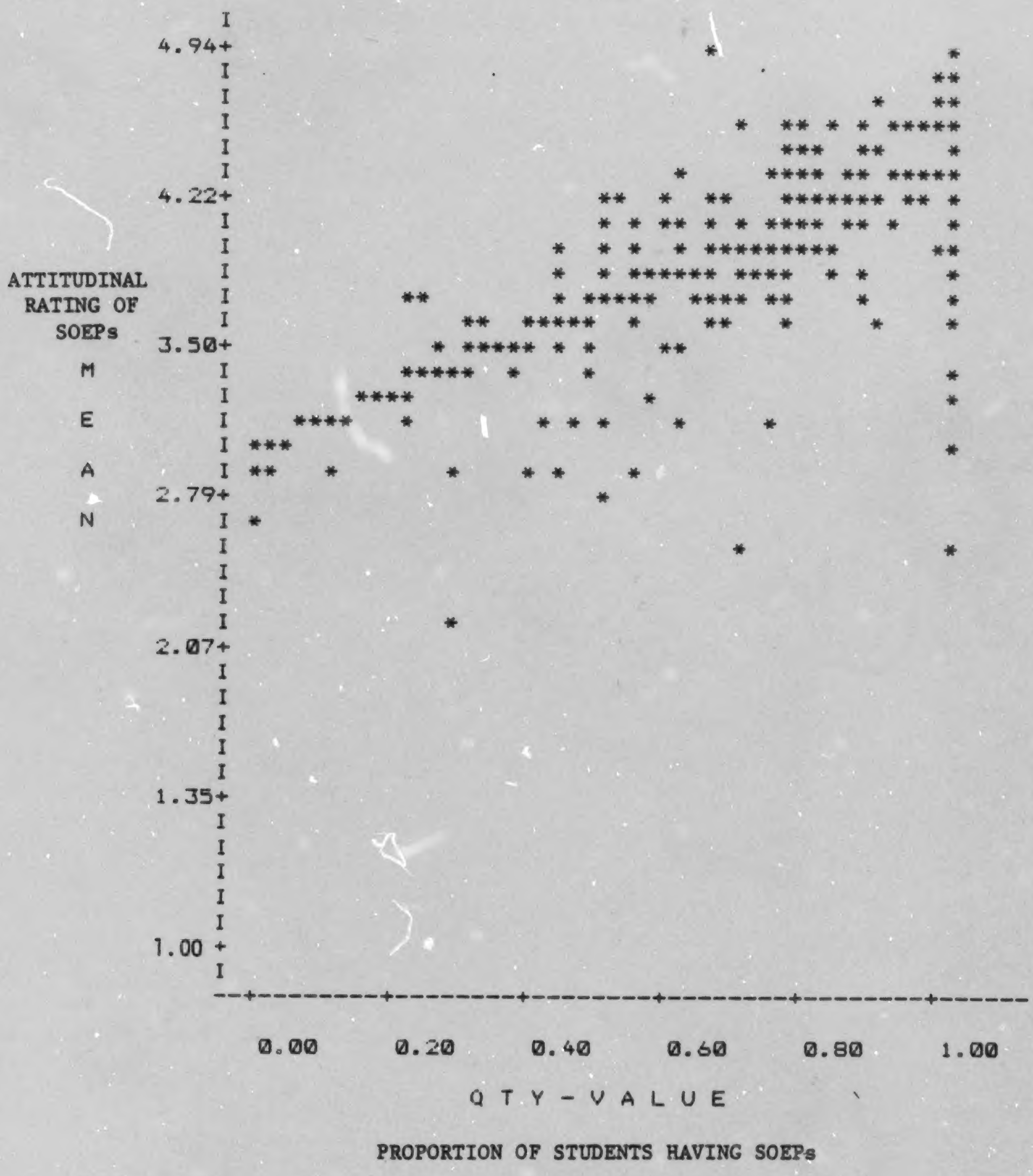

Figure 1

Linear Regression of Quantity Value by Attitudinal Mean Plot

Ho2: There is no difference in the proportion of students with SOEPS taught by vocational agriculture teachers who had SOEPs in high school and the proportion of students with SOEPs taught by vocational agriculture teachers who did not have SOEPs in high school.

The F ratio of 96.29 was statistically significant at the .05 level of probability (Table 1). Teachers who had SOEP experiences as high school students had a higher proportion (quantity value = .88) of vocational agriculture students currently with SOEPs. Vocational agriculture teachers who did not have an SOEP in high school had a quantity value of .64. The null hypothesis was rejected.

Table 1

ANALYSIS OF VARIANCE FOR QUANTITY VALUES OF VOCATIONAL AGRICULTURE TEACHERS HAVING SOEPs IN HIGH SCHOOL AND VOCATIONAL AGRICULTURE TEACHERS NOT HAVING SOEPs IN HIGH SCHOOL*
UNITED STATES - 1984

Source	Sum of Squares	Degrees Freedom	Mean Squared	F-Ratio
Total	15.02	304	-	96.29
Between Groups	3.62	1	3.62	
Within Groups	11.40	303	.03	

*p .05 = level of probability used to ascertain significant differences.
F = 3.88, the critical value.

Ho3: There is no difference in the attitude toward SOEPs of vocational agriculture teachers who had SOEPs in high school and the SOEP attitudes of vocational agriculture teachers who did not have SOEPs in high school.

The F ratio of 161.34 was statistically significant at the .05 level of probability (Table 2). Teachers (attitude mean = 4.20) who had SOEP experiences as high school students had higher attitudinal scores than vocational agriculture teachers (attitude mean = 3.58) who did not have SOEPs in high school. Null hypothesis three was rejected, as there was a significant difference in the attitudes of teachers having had SOEPs while in high school and the attitudes of teachers not having SOEPs while in high school.

Table 2

ANALYSIS OF VARIANCE FOR ATTITUDE STATEMENTS OF VOCATIONAL AGRICULTURE TEACHERS HAVING SOEPs IN HIGH SCHOOL AND VOCATIONAL AGRICULTURE TEACHERS NOT HAVING SOEPs IN HIGH SCHOOL* UNITED STATES 1984

Source	Sum of Squares	Degrees of Freedom	Mean Squared	F-Ratio
Total	68.40	304	-	161.34
Between Groups	23.76	1	23.76	
Within Groups	44.63	303	.14	

*p .05 = level of probability used to ascertain significant differences.
F = 3.88; the critical value.

CONCLUSIONS

The following conclusions were based upon the findings in this study:

1. Vocational agriculture teachers who have a more positive attitude toward SOEPs have a higher proportion of students with SOEPs in their current vocational agriculture program.
2. Vocational agriculture teachers who had an SOEP in high school had a higher proportion of students with SOEPs.
3. Vocational agriculture teachers who had an SOEP in high school had a more positive attitude toward SOEP.
4. The quantity of SOEPs only measure numbers of students. Quantity does not measure the quality of SOEP.

RECOMMENDATION

The following recommendations were made for teacher preparation programs:

1. Involve prospective teachers of vocational agriculture in an SOEP experience prior to their teaching vocational agriculture (conduct an SOEP while in college).
2. Include the importance of SOEPs and hands-on applications of SOEPs in methods courses taught by teacher educators in agriculture.
3. Require student teachers in agriculture to supervise SOEPs during their professional teaching semester.
4. Conduct inservice training workshops to increase the awareness and applications of SOEPs in vocational agriculture programs.

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A Critique

Employers' Perceptions of Agribusiness Placement SOE Programs

by Gregory W. Fletcher, David L. Williams,
and W. Wade Miller

Factors Influencing Student Participation and Perceptions of Supervised Occupational Experience Placement Programs

by John W. Slocombe

Attitudes of Vocational Agriculture Teachers Toward Supervised Occupational Experience Programs

by Fred Reneau, Rose Roider, James Legacy,
and Tom Stitt

Discussant John Hillison
Virginia Tech

National Agricultural Education Research Meeting
New Orleans, LA
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My experience in serving as a discussant for the 1984 NAERM Conference was an enjoyable one. I have attempted to follow the rules as established by Chairman, Jimmy Cheek. Dr. Cheek emphasized:

> I would like for you to encourage the presenters with positive statements first and then objectively point out shortcomings and suggestions for improvements. It is also your responsibility to suggest applications and implications of the research which may not have been emphasized or even mentioned in the presentations. (Cheek, 1984)

Overall, I was pleased with the research completed; especially, the topics involved. It is good to see a renewed interest in supervised occupational experience programs. For a while it appeared as though such interest had virtually disappeared. Another indication of such interest is the fact that approximately 20% of the articles published in The Journal of the AATEA for the year 1984 were on the topic of SOEP.

Paper Analysis

Paper 1. Employers Perceptions of Agribusiness Placement SOE Programs by Fletcher, Williams, and Miller.

I was most pleased with the perspective of the paper. It sought to examine someone's perspective other than our own. We sometimes spend a lot of energy looking at the perspective of or at each other when we should emphasize how others directly involved with the program see us.

The introduction provides an excellent example of how to do it. This paper's introduction ties the topical area of agribusiness placement back to the 1963. It quotes Phipps, and has a contemporary quote for a National FFA publication. All of this is done in a concise manner in the rather limited amount of space available. There is an equally effective purpose and objectives section.

The procedures section points out a well organized and well thought-out "battle plan" for collecting data. The data were collected in the fall of 1981. I find it a rather long time until reported here in December of 1984. The return rate of 55.4% with only 51.8% useable instruments represents a somewhat low, but not unreasonable response. I am certain it is more difficult to get agribusiness personnel to complete an instrument than to get professional educators to complete one. Also, the follow-up procedures were quite throrough and I am convinced that the respondents results can be generalized to the population.

This is the appropriate place to discuss the instrument. As noted in the paper the 35 occupational abilities were drawn from a review of literature. I attempted to classify each item into its appropriate educational domain. Admittedly, there are some arguable points and possibly overlapping purposes. However, I found 26 (74%) items for the cognitive domian, eight (23%) items for the affective domain, and only 1 (3%) item for the psychomotor domain. Interestingly, that one psychomotor domain item, "Use equipment in an agribusiness job" was rated the highest by the employer subjects. Whenever I have asked employers what they expected from employees they generally emphasize such affective skills as getting to work on time, giving a day's work for a day's pay, getting along with the supervisor, and getting along with fellow employees. The item "Establish and maintain businesslike relationships with others" only hints at the latter two frequently made points. I would have liked to see a somewhat different perspective on the instrument, especially in the area of affective and psychomotor domains.

In the area of results, a generally good job of reporting could be found. The most interesting results to me involved Table 2 which reported the Importance of Factors in planning and conducting vocational agriculture students' agribusiness employment experiences. I could not help but notice that of the of 16 factors listed, vocational agriculture classes were ranked 9th. Vocational agriculture classes were outranked by high school classes other than vo-ag, by FFA Chapter activities, by student's parents or guardian(s), and by people in the agribusiness where students work.

Apparently, our vocational agriculture instructors are not teaching the right things or the employers perceive the right things are not being taught. The point on the importance of the parents becomes logical after some thought. Having attempted to place students in cooperative work stations and being queried as to who the student would be, I can understand the rating for this item. In many small rural towns one's last name and one's parents are extremely important for the social structure.

The point on FFA Chapter activities being rated higher than vocational agriculture classes deserves a closer examination. What is it about the FFA that caused a higher rating? I have heard the Chief of Agricultural Education for the United States, Dr. Larry Case, (Case, 1984) comment that the way to bring about change in the vocational agriculture curriculum is to have an FFA Contest on an area. I believe he is correct. In a study to be published in the winter issue of The Journal of AATEA Rush and Foster found that Idaho vocational agriculture teachers, principals, and superintendents indicated that: "Maintaining an active FFA Chapter received higher importance ratings than teaching agricultural classes." Is it time that we recognized vocational agriculture as an integral part of the future Farmers of America?

Paper 2. Factors Influencing Student Participation and Perceptions of Supervised Occupational Experience Placement Programs by John W. Slocombe

The review of related literature was rather cursory. The introduction spent most of its space discussing a previous study completed by the author as a co-researcher. The present study re-analyzed data collected from the previous study. I congratulate the author on getting a two for one return with his data.

The study reports that the population: "Consisted of sophomore vocational agriculture students and vocational agriculture instructors in the north central and south central vocational agriculture/FFA districts in Iowa during the 1982-83 school year." I would have preferred having the following questions answered. Why sophomores? Why north central and south central districts? What was the N size for the population?

The point on the sophomores is an important one. The Child Labor Provisions of the Fair Labor Standards Act (Child Labor) greatly limits what children under age 16 can do. Admittedly exceptions are made for certain agricultural occupations. The second point is that our SOE placement students should have as much technical agriculture background and maturity as possible before the actual placement. This is one time where it is important to know whether the data were collected in the fall or the spring of the year. There could be a major difference in legal status, maturity, and technical knowledge of the students. It would appear that juniors and, preferably, seniors could have been a better group from which to collect the data. For the younger group such as sophomores, we really have a good group for collecting beginner's perceptions.

The instruments used proved to be quite interesting. I found that multiple choice questions were used to assess knowledge, semantic differential was used to assess attitude, and the Thurstone scale was used to assess the program planning inventory. This much variety is quite unusual; however, overall there appears to be no problems with it.

It is also interesting to note that 322 students and 29 instructors, representing 100% of the sample, completed the instruments. One has to wonder if the true sample is not really the number of schools to which the instruments were distributed. If that is the situation, this selection procedure should be called cluster sampling and would have implications for the n size.

One of the first results which caught my attention was the fact that instructors increased from 8.25 days to 11.14 days the amount of time spent teaching students about SOE placement programs. One wonders what has caused this difference. Have the teachers been motivated by the new emphasis on SOE? Were the teachers aware of the fact that they were in a study emphasizing SOEP? Or was it something else? Also, does that SOE placement time include record books and other related topics or just SOE placement?

Table 2 is a bit confusing to read with a column heading of percentage when over half of the data reported represents frequencies.

It is interesting to note that farm students had a significantly higher knowledge score on SOE placement than did the city or town students. At the same time the farm students had a program planning score just barely higher (37.86

to 36.95) than the city or town students. It is also interesting to speculate on what might be the cause of this occurrence. Was there something about a farm background that assisted the students in knowing more about SOE placement?

Another interesting finding was the correlations found between months of agribusiness experience and the dependent variables. The relationships with attitude score and program planning score were both ever so slightly positive, .072 and .091 respectively. The relationship with knowledge score was slightly negative with an n value of -.147. What does this imply for state certification requirements on work experience? Does it imply a point of diminishing returns for such background experience?

One last comment has to do with tieing the conclusions and recommendations together. The author does that very effectively in this paper. They are placed together in the same section and follow each other quite logically. I like to see that approach.

Paper 3. Attitudes of Vocational Agriculture Teachers Toward Supervised Occupational Experience Programs by Reneau, Roider, Legacy, and Stitt

I found the introduction to be a rather cursory one. There were only superficial points made concerning the background base for the study. On the other hand, the purpose and objectives section and the research questions were adequate in their statements. One minor point concerning the wording of research questions is to ask what is the relationship between variables, rather than is there a relationship which can be answered by a simple yes or no response.

My compliments to the researchers for taking on the ambitions project of a national study. There are two points of clarification I would like to have seen. The first is how was a sample size of 373 selected when the population was 12,474? The second point has to do with the field test of the instrument. The instrument was field tested with 11 vocational agriculture teachers in District V. As a former teacher in Illinois, in District V - I assume it was that district.

Overall, it appears that sound and logical procedures were used by the researchers. My remaining comments could be categorized as basically editorial in nature. One is that it is helpful to the reader to note that when 305 of 373 instruments are returned that a return rate of 82% has been accomplished. It is helpful to discuss the follow-up procedures used to enhance the return rate. It is also helpful to state alpha levels for rejection or acceptance of null hypothesis statements.

For the sections on conclusions and recommendations, support from both the conservative and liberal wings was achieved. The conclusions were quite conservative. One exception to that rule is conclusions 4 "the quantity of SOEPs only measures numbers of students. Quantity does not measure quality of SOEP," which is really a limitation. The recommendations, on the other hand are generaly quite liberal. I will point out the exception first - which is recommendation one recommending that students conduct a SOEP while in college. The other three recommendations go beyond both the scope of the study and the data to recommend activities for methods courses, student teaching, and inservice education.

As a fellow teacher educator, my biases are in agreement with those of the researchers. However, they should have been more honest and included the last three recommendations under the heading "Biases of the Researchers."

Overall, I would categorize the paper as a good one. In general, the researchers found what most would have speculated to be the situation. I believe it is good to periodically re-confirm our facts.

My job as a discussant for this year's conference has been a pleasant one. I have enjoyed reading all three papers. They emphasized a basic tenet in vocational agriculture, that of the SOEP. They were quite compatible for presentation together. They were interesting and they made good points.

As is always the case, it is easier to find fault with someone else's work than with my own. I appreciate all of the authors' indulgence toward that end.

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THEME: AGRICULTURAL MECHANICS INSTRUCTION

A MODEL OF VARIABLES INFLUENCING SAFETY ATTITUDES OF AGRICULTURAL MECHANICS STUDENTS

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INTRODUCTION

Safety instruction is an integral component of agricultural mechanics instruction. Most units of instruction in agricultural mechanics emphasize safety practices. Safety as a unit in itself is generally not taught as a separate complete unit of instruction. Rather, safety has been intertwined into the various units of instruction.

Safety instruction appears to revolve around the concept of providing the student or worker with adequate knowledge, skill, and attitudes to prevent accidents. In the instruction of agricultural mechanics, the instructor can test a student's knowledge of safety practices. Also, he/she can provide sufficient practice to allow the student to operate equipment and machinery in a safe manner.

The actual role of safety attitudes towards preventing accidents has been, and will continue to be, debatable. Krejcie (1972) considered attitudes by far the most important psychological aspect of safety in any endeavor. However, Murphy (1980) in a study of farm accidents found that safety attitudes were not correlated with the frequency or intensity of accidents.

The conceptual framework of this study was derived from two models of classroom learning. The first model was presented by Dunkin and Biddle (1974), "A Model for the Study of Classroom Teaching" and the second model was presented by McDonald and Elias (1976) which represents a structured model of variables impacting teaching performances and student learning. A model of the development of student safety attitudes has been derived from these two models. This model, see Figure 1, represented the anticipated relationship of the selected variables and student safety attitudes. Entitled "A Model of Variables Influencing Student Safety Attitudes," this model served as the conceptual framework upon which this study was investigated.

Insert Figure 1 About Here

OBJECTIVES

The primary objective of the study was to develop a model of those variables which influence the formation and development of safety attitudes of agricultural mechanics' students. Also, this study attempted to determine the strengths and directions of the relationships between selected student predictor variables and the students' measured attitude towards safety.

PROCEDURES

The target populations of the study were four strata of students enrolled in agricultural mechanics courses throughout the State of Ohio. The four levels of students enrolled in courses of agricultural mechanics were:

1. Junior and Senior Students in High School Agricultural Production Courses
2. Joint Vocational School Agricultural Mechanics Students
3. Two-Year Technical College Students Enrolled in Agricultural Mechanics Courses
4. Four-Year University Students Enrolled in Agricultural Mechanics Courses

The sampling technique used for this study can best be described as being a stratified random cluster sample. Since it was not possible to randomly assign students to a specific course or school, the classes, i.e., clusters, were used as the unit of random selection.

For the high school and joint vocational school classes, the 1982-1983 Directory of Departments of Vocational Agriculture in Ohio served as the frame for the population.

The number of teachers contacted was based upon the cumulative number of students enrolled in the teacher's classes. The objective was to obtain approximately 75 students in each level. This objective was based upon a rationale presented by MacCallum (1982) that for a correlational study the sample size should be greater than 10 x (k + 1) where k represents the number of independent variables. The minimum acceptable sample size was determined to be 230 based upon 22 independent variables. Thus, 75 students in each of the four levels provided an adequate sample. All teachers contacted agreed to participate in the study and administer the survey instrument to their class. A 100 percent response was obtained. The number of completed surveys returned is represented in Table 1.

Insert Table 1 About Here

An initial survey instrument was developed for this study. This instrument was pilot tested to a group of 17 students enrolled in an Agricultural Mechanics course at the Ohio State University. The reliability of the Likert-type quantitative measures was established by computing a series of reliability coefficients using the Cronbach's Alpha statistical techniques.

The returned questionnaires were tested for reliability of the quantitative measures using Cronbach's Alpha strategies. The final reliability coefficients can be found in Table 2. It should be noted that the reliability coefficient of one measure, Perception of Safety Knowledge, was unsatisfactory (less than .50). Therefore each of the four items in this measure was treated as a separate independent variable. The reasoning was that it appeared that each item was indeed measuring a separate, but moderately related aspect of a person's perception of his/her safety knowledge.

Insert Table 2 About Here

For each of the variables of interest in this study, descriptive data were analyzed in the form of frequencies, and measures of central tendency appropriate for the type of data. Correlational techniques were incorporated to establish the direction and strength of the relationships between the predictor and criterion variables. A series of Pearson Product Moment Correlation Coefficients was computed between each independent variable and the dependent variable; student safety attitudes.

The criterion variable, student safety attitudes, was treated in the form of interval data within a regression equation. The score was attained by the sum of individual responses to the 16 items on the survey instrument. Each group of variables (student formative experiences and properties, and process variables) was applied to a simultaneous multiple regression which determined the proportions of variance which could be explained by each group of variables. This technique employed the use of semi-partial multiple regression correlational coefficients for each set of independent variables. For the nominal, classification variables dummy coding techniques were used in the regression analysis. By subtracting the proportion of variance explained by the full regression model without the desired set of independent variables from the proportion of variance explained by the full model, these squared semi-partial proportions of variance were then tested for significance.

A stepwise multiple regression analysis was completed to develop a regression equation which could best predict student safety attitude scores. The school and home process variables were included in the stepwise regression analysis as well as those student formative experiences having a significant relationship whith the dependent variable.

RESULTS

The following section will summarize the findings for each of the four areas of interest.

Formative Experiences

A significant proportion of variance in the measured student safety attitudes was explained by the cumulative set of student formative experiences (Table 3:$sR^2 = .1184$, $F = 3.25$, $p < .01$). Of the student formative experiences, the following demonstrated a significant relationship with the dependent variable.

1. Safety Knowledge Perception ($r = .27$)
2. Type of School ($r = .22$)
3. Type of Work Experience ($r = .15$)

The remaining selected student formative experiences proved not to have significant relationships with the dependent variable.

School Process Factors

The three selected school process variables prove to possess significant relationships with the measured student safety attitudes.

1. Perception of Teacher Safety Attitude ($r = .42$)
2. Perception of Teacher Safety Knowledge ($r = .49$)
3. Perception of School Safety Environment ($r = .35$)

Also, the collection set of selected school process variables explained a significant proportion of variance in the dependent variable (Table 3: $sR^2 = .0675$, $F = 8.69$, $p < .01$).

Home Process Variables

Each of the three home process variables did have a significant relationship with student safety attitudes.

1. Perception of Parent's Safety Knowledge ($r = .35$)
2. Perception of Parent's Safety Attitude ($r = .41$)
3. Perception of Home Safety Environment ($r = .36$)

Furthermore, the cumulative set of these process variables did account for a significant proportion of variance in the student's safety attitudes (Table 3: $sR^2 = .0343$, $F = 4.40$, $p < .01$).

Work Process Variables

The complete set of the three work process variables did not explain a significant proportion of variance in student safety attitude scores (Table 3: $p < .05$). However, there were significant, but relatively low, relationships between student perceptions of employer safety knowledge, attitudes, and work place safety environment with safety attitudes to warrant their individual impacts.

1. Perception of Employer's Safety Knowledge (r = .16)
2. Perception of Employer's Safety Attitude (r = .17)
3. Perception of Work Place Environment (r =.23)

Insert Table 3 About Here

Attitude Prediction

The following variables were determined by a stepwise regression analysis to be the best predictors of student safety attitudes (Table 3).

1. Student's Perception of His/Her Teacher's Safety Knowledge
2. Student's Perception of His/Her Parent's Safety Attitude
3. Student's Perception of His/Her Agricultural Mechanics Safety Knowledge
4. Student's Type of School

Insert Table 4 About Here

CONCLUSIONS AND RECOMMENDATIONS

Based upon the findings of this study, there appear to be several significant factors contributing to the development of safety attitudes in agricultural mechanics students.

First, there does appear to be an overall increase in safety attitude scores as students get older; into higher levels of education. This can be best explained by the relative maturity of students from the secondary to postsecondary level.

Second, the type of work experience of a student appears to effect safety attitudes. Those students with work experience on the farm or vocationally, did indeed score higher on the safety attitude instrument.

Third, the involvement of a student in an accident, or of friends or relatives, does not appear to have much of an effect on student safety attitudes.

Fourth, the influence of a student's teacher and school appears to have an effect upon safety attitudes. The highest relationship was between the students perception of the teacher's safety knowledge and safety attitudes. Thus, it appears teachers should work towards demonstrating a positive safety attitude, a sound knowledge of safety, and maintain the schools facilities in safe working condition.

Fifth, the influence of a student's parents seems evident. The home process variables did explain significant variance in safety attitudes. This seems to imply that parents, as was the case with teachers, need to demonstrate positive safety attitudes, safety knowledge, and maintain a safe home environment.

Finally, the employer and the work place did not seem to have as great an influence upon student's safety attitudes as did the teachers and the parents. This probably can be explained by the relative lack of contact between the employer and the student. However, this study should provide an incentive to employers to attempt to be a greater influence upon student's safety attitudes.

Based upon the findings and conclusions of this study, the model, "Variables Influencing Student Safety Attitudes" has been restructured. This model formed the conceptual framework upon which this study was based. The new model can be found in Figure 2. The variables, or factors, included in the revised model, "A Model of Student Safety Attitudes," were those which contributed a significant proportion of variance in the dependent variable, student safety attitudes. The work process variables were deleted from the model since they did not account for a significant proportion in the students' safety attitudes. However, there were significant, but low, positive relationships between these factors and the dependent variable.

Insert Figure 2 About Here

From the findings of this study, the following implications for actual practice have been developed. Since teachers of agricultural mechanics have a significant impact upon their student's safety attitudes, they need to demonstrate the following ideals at all times.

1. Correct Safety Practices
2. Accurate, Factual Safety Knowledge
3. A Safe Learning Environment
4. Positive Safety Attitudes
5. Students who Demonstrate Safe Practices, Knowledge, and Attitudes

Since parents also appear to have a definite influence upon the development of student safety attitudes, they need to recognize their role and influences. Teachers also need to encourage and provide support for the parents' roles in student attitudinal development.

Furthermore, employers need to recognize that they are not impacting student safety attitudes as much as are the school and home environments. Employers need to provide direction in student attitudinal development by placing greater emphasis upon student safety knowledge, practices, attitudes, and providing a safe working environment. Teachers need to provide assistance and expertise to employers of students so as to enhance the development of positive attitudes. Such assistance should be in the form of guidelines and expertise in areas of safety knowledge, practices, and attitudinal development.

Safety is a vital aspect of agricultural mechanics education. It appears as though work experiences, maturation, teachers, parents, and to a lesser extent employers, have a definite impact upon student perceptions toward safety. The key to safety attitudes appears to be based upon the perceptions of the student. The way a student feels, thinks, or perceives safety factors has an impact upon his/her attitudes. Teachers, parents, and employers need to recognize their roles in the development of young peoples' attitudes. Students appear to be influenced by their surroundings.

Safety in agricultural mechanics deserves much investigation and attention. Accidents not only cause personal injury but also loss of productivity and money. The findings of this study provide insights into safety, in general, as well as agricultural mechanics.

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Table 1

Number of Students Participating in Study

Level	Number of Students	Percent
High School	68	26.4
Vocational School	81	31.4
Technical School	42	16.3
University	67	26.0
Total	258	100.1

Table 2

Actual Reliability Coefficients of Implemented Survey Instrument

Instrument Component	Number of Items	Reliability* Coefficient
Student safety attitude	16	.87
Perception of safety knowledge	4	.51
Perception of teacher's safety attitude	5	.86
Perception of school's safety environment	5	.85
Perception of parent's safety knowledge	5	.76
Perception of parent's safety attitude	5	.87
Perception of home safety environment	5	.71
Perception of employer's safety knowledge	5	.87
Perception of employer's safety attitude	5	.83
Perception of work safety environment	5	.81

* Cronbach's Alpha n = 258

Table 3

Semi-Partial Multiple Regression Coefficient for Sets of Independent Variables

Variable set	k_A	k_B	sR^2	F
Student formative experiences	9	14	.1184	3.25*
School process	20	3	.0675	8.69*
Home process	20	3	.0343	4.40*
Work process	20	3	.0107	1.37

Total R^2 = .427244 n = 244

$p < .01$

Table 4

Step-Wise Multiple Regression of Student Safety Attitude Scores on the Significant Independent Variables

Independent variables		R^2	R^2 Increment	F
Student's perception of:				
Teachers' safety knowledge	(x_1)	.2317	.2317	72.98**
Parent's safety attitude	(x_2)	.2902	.0585	8.83**
Own ag. mechanics safety knowledge	(x_3)	.3313	.0411	4.82**
Type of school	(x_4)	.3599	.0286	2.67*

* $p < .05$
** $p < .01$

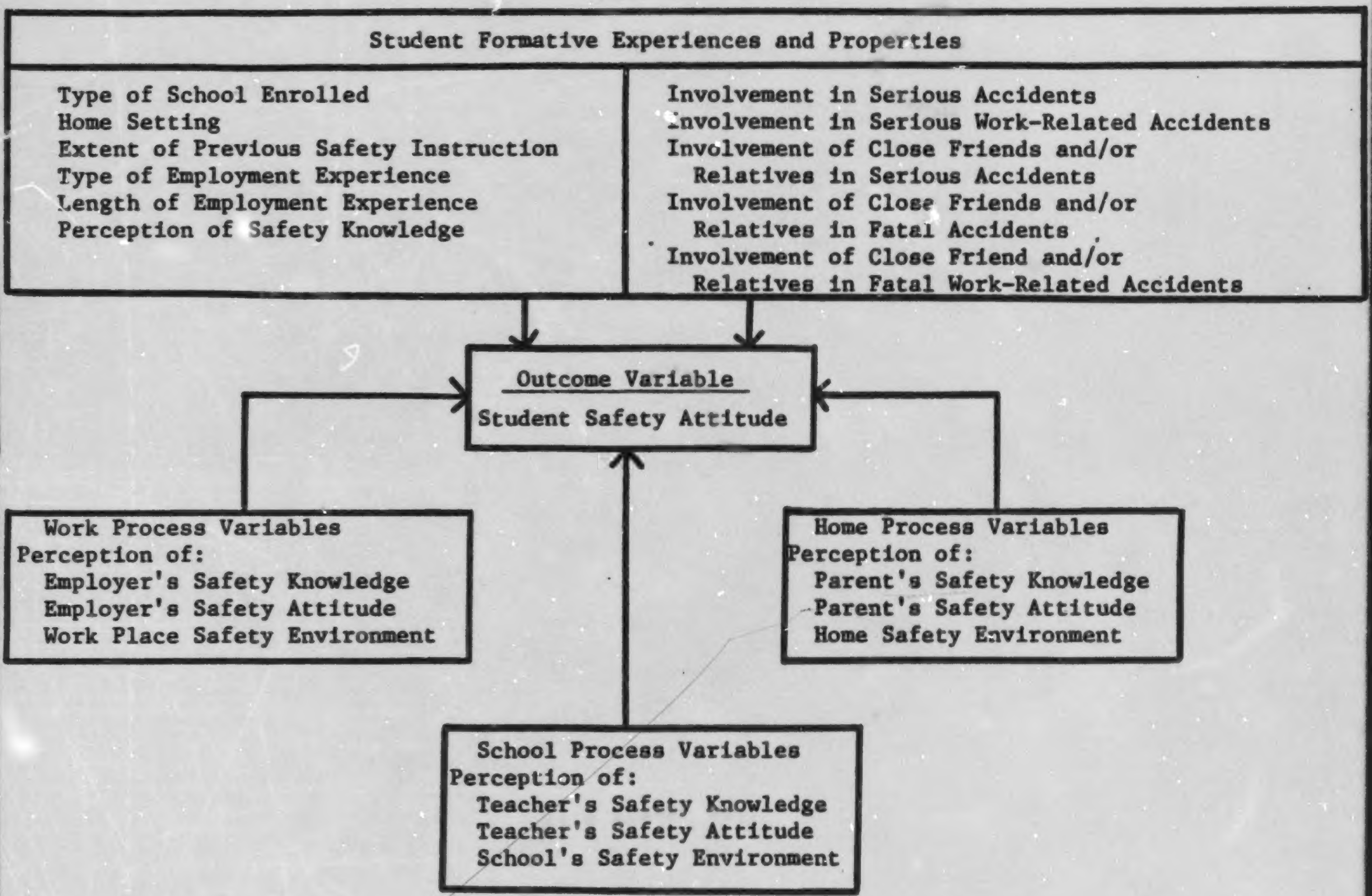
Student Formative Experiences and Properties
Type of School Enrolled
Home Setting
Extent of Previous Safety Instruction
Type of Employment Experience
Length of Employment Experience
Perception of Safety Knowledge
Involvement in Serious Accidents
Involvement in Serious Work-Related Accidents
Involvement of Close Friends and/or Relatives in Serious Accidents
Involvement of Close Friends and/or Relatives in Fatal Accidents
Involvement of Close Friend and/or Relatives in Fatal Work-Related Accidents
Outcome Variable
Student Safety Attitude
Work Process Variables
Perception of:
Employer's Safety Knowledge
Employer's Safety Attitude
Work Place Safety Environment
Home Process Variables
Perception of:
Parent's Safety Knowledge
Parent's Safety Attitude
Home Safety Environment
School Process Variables
Perception of:
Teacher's Safety Knowledge
Teacher's Safety Attitude
School's Safety Environment

Figure 1: Variables Influencing Student Safety Attitudes

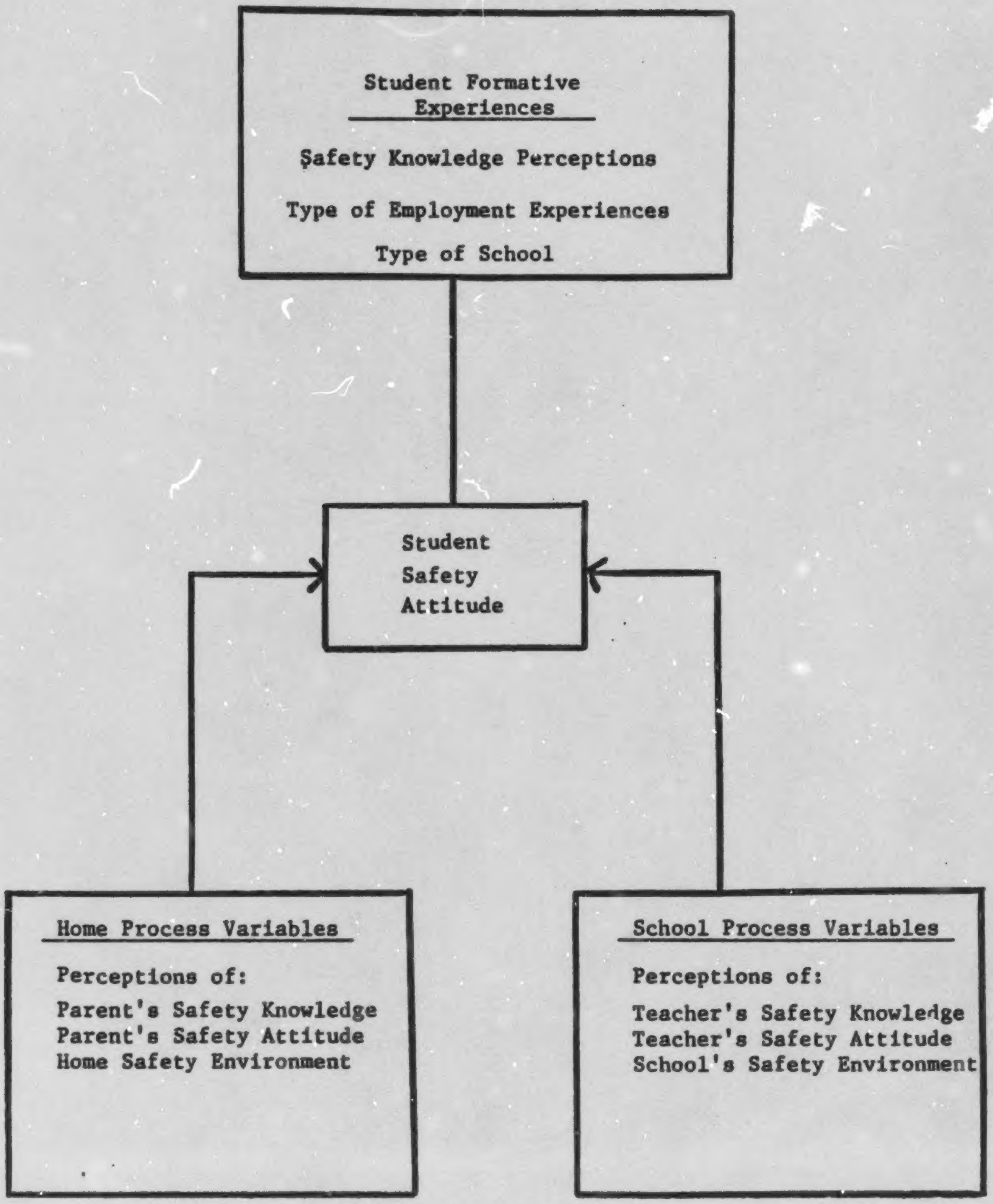
Student Formative Experiences
Safety Knowledge Perceptions
Type of Employment Experiences
Type of School
Student Safety Attitude
Home Process Variables
Perceptions of:
Parent's Safety Knowledge
Parent's Safety Attitude
Home Safety Environment
School Process Variables
Perceptions of:
Teacher's Safety Knowledge
Teacher's Safety Attitude
School's Safety Environment

Figure 2: A Model of Student Safety Attitudes

A COMPARISON OF EXISTING STANDARDS FOUND IN NEBRASKA SECONDARY SCHOOL VOCATIONAL AGRICULTURE MECHANICS LABORATORIES WITH STANDARDS DEVELOPED ON A NATIONAL AND REGIONAL LEVEL

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INTRODUCTION

Historically, teachers of vocational agriculture have made such effective use of their community resources that school officials have allowed departments to exist in poor condition (6).

The federal legislation of 1963 and 1966 provided much needed federal money for vocational education facilities and equipment. However, for a variety of reasons, newly constructed facilities and newly purchased equipment soon became obsolete. The reasons for obsolescent facilities were: 1) little or no future planning, 2) the vocational teacher was not consulted before or during construction, 3) architects had limited knowledge of effective program procedures, and 4) the lack of program standards. (6)

Vocational agriculture facilities should be built to meet the present and future needs of the instruction taking place. Age has nothing to do with the effectiveness of a facility as a teaching center. The difference is the planning that went into that facility when it was first constructed. (8)

Unfortunately, there are still many states that do not have minimum standards regarding vocational agriculture departments that can be enforced. Quite often weak or dying programs can be traced to inadequate facilities. (6)

In an effort to help eliminate variation between states, the "Standards for Quality Vocational Programs in Agriculture/Agribusiness Education" was validated through a project conducted by Iowa State University in 1977 (13). This project provided guidelines which may have helped, but there are still states that have not adopted these standards. Nebraska was one such state.

The national standards on which this study were based came from the "Standards for Quality Vocational Programs in Agriculture/Agribusiness Education" (13).

STATEMENT OF PROBLEM

The problem addressed by this study was to compare the existing conditions in Nebraska vocational agriculture mechanics laboratories with a set of standards developed on a national and regional level for vocational agriculture mechanics laboratories. Although the project had six total objectives, for purposes of this paper the following objective was identified.

SPECIFIC OBJECTIVE

To what extent do Nebraska vocational agriculture mechanics laboratories meet standards developed on a national and regional level.

LIMITATIONS OF THE STUDY

The study was limited to the following areas relating to the organization and operation of the vocational agriculture laboratory; 1) safety, 2) budget, 3) drainage, exhaust, and dust control systems, 4) electrical and compressed air systems, 5) laboratory size and proportions, and 6) student numbers.

PROCEDURES

Population and Sample

The population for this study was all 136 Nebraska high school vocational agriculture departments. Each department was located in one of the eight Nebraska Vocational Agriculture Association (NVAA) districts. The NVAA districts were used as strata to obtain a proportional random sample of the population. A 25 percent random sample was selected from each district. The total number of departments in the sample was 37. All vocational agriculture instructors at the 37 schools agreed to participate in the study.

Instrument Development

A review of literature was conducted to obtain a list of standards for the instrument. "The Standards for Quality Vocational Programs in Agricultural/Agribusiness Education" which was developed by teacher educators and directed by the Iowa State staff lacks specificity in agriculture mechanics laboratory guidelines. But, these nationally developed standards were used as much as possible in the construction of this instrument. The instrument was validated by a group of teacher educators with expertise in vocational agriculture mechanics laboratory facilities. The group consisted of teacher educators from Nebraska, Iowa, South Dakota, Minnesota, and Kansas. All of the reviewing participants were encouraged to make suggestions for changes in the instrument.

The revised instrument was then printed and used by the author in collection of the data. The instrument was constructed with the minimum standards on the left side of each page and a Likert scale on the right side of each page. There were three possible categories for each minimum standard:

1 = facility does not meet minimum standard,
3 = facility meets minimum standard, and
5 = facility exceeds minimum standard.

Each standard was given equal weight in the analyses of the data.

The instrument was pilot tested at a local vocational agriculture department that was not included in the sample for the study. The instrument was then completed by the author during the on-site interviews, as measurements, observations, and calculations were made at all 37 departments.

RESULTS

The findings were significant in that, 17 of the 37 standards observed were not met by a majority (>50%) of the departments in study. These standards include:

1. One instructor in the department holds a current Red Cross first-aid card or its equivalent.
2. Laboratory stationary power equipment is color coded to ASAE safety standards.
3. Ground fault circuit interrupted (GFCI) outlets located for use of electric power equipment outdoors.
4. Safety zones located for maximum efficiency.
5. Non-skid material is used effectively.
6. Laboratory sump type floor drain should be 12 square feet.
7. A dust collection system is used in the laboratory.
8. Laboratory lighting for work areas is 80 foot candles.
9. The laboratory has at least 4 compressed air outlets.
10. Laboratory size is at least 3200 square feet.
11. Laboratory space per student is 140 square feet.
12. Laboratory open floor space is 1700 square feet.
13. Laboratory ceiling height is 17 feet.
14. Laboratory overhead door width is 17 feet.
15. Laboratory overhead door height is 14 feet.
16. Laboratory workbench lengths do total 100 feet.
17. There are maintenance and service records of electrical power equipment on file in the departmental office.

The possible causes for these standards not being met could be: 1) lack of state enforced guidelines, 2) school boards not willing to allocate funds, or 3) lack of initiative by the vocational agriculture instructor.

The standards most often met by the departments were those where teacher liability could be questioned or state building and fire codes were enforced. Examples include: 1) first-aid kit located in the department, 2) fire alarm breaker switch located in the laboratory, 3) safety instruction provided in advance of laboratory work, 4) and laboratory has two (2) service doors. This would indicate that only those standards that are backed up with enforcement or penalty are used in the laboratory.

IMPLICATIONS

The need for safe, adequate, and well maintained vocational agriculture laboratories is the responsibility of the local teacher, administration and board of education. The need for support from teacher education and state staff is a must if changes are to occur in these facilities.

Some implications determined as a result of the study are:

1. More laboratory management education is needed for undergraduate students in agriculture education.

2. Teacher in-service education is needed to improve laboratory management skills. Some possible in-service topics include:

    A. Color coding of equipment
    B. Equipment maintenance and repair
    C. Safety and first-aid planning
    D. Tool and supply storage planning
    E. Floor planning for equipment

3. An observation checklist (guide) should be used by local boards of education to determine the standards in their local vocational agriculture mechanics laboratories.

4. An observation checklist (guide) should be used by the state department of education when evaluating all vocational agriculture mechanics laboratories.

5. If teacher education would incorporate this type of checklist in evaluating student teaching centers the overall experience for student teachers could be improved.

6. If merit pay for teachers becomes a reality, this observation checklist (guide) could be used to determine the extent to which teachers implement certain standards that are under their control or make recommendations to their board of education with respect to other standards requiring board action or funds to improve.

NUMBER OF SCHOOLS WHICH DID NOT MEET, MET OR EXCEEDED THE STANDARDS DEVELOPED ON A NATIONAL AND REGIONAL LEVEL

Table 1

	Number of schools		
Standard	Did not meet standard	Met standard	Exceeded standard
Safety Area			
1. One instructor in the department holds a current Red Cross first-aid card or its equivalent.	28 (75%)	9 (25%)	0
2. Laboratory stationary power equipment is color coded to ASAE safety standards.	37 (100%)	0	0
3. The departmental office is located so as to provide supervision of laboratory activities.	13 (35%)	21 (56%)	3 (8%)
4. Instruction in safety is provided in advance of any laboratory work.	0	21 (56%)	16 (43%)
5. Ground fault circuit interrupter (GFCI) outlets located for use of electric power equipment outdoors.	36 (97%)	1 (2%)	0
6. Safety zones located for maximum efficiency.	30 (81%)	7 (19%)	0
7. Non-skid material is used effectively.	37 (100%)	0	0
8. Fire alarm breaker switch located in the laboratory.	3 (8%)	22 (59%)	12 (32%)
9. A first-aid kit located in the department.	2 (5%)	14 (37%)	21 (56%)
10. Fire extinguishers are well marked and in easily accessible locations.	1 (2%)	13 (35%)	23 (62%)
11. Safety Area TOTAL	35 (94%)	2 (5%)	0
Budget Area and TOTAL			
12. An annual school board approved budget that considers: A) equipment and material purchases and replacement, B) repair of equipment, and C) consumable supplies	12 (32%)	23 (62%)	2 (5%)

Table 1 -- Continued

Standard	Number of schools Did not meet standard	Met standard	Exceeded standard
Drainage, Exhaust, and Dust Collection Systems Area			
13. Laboratory sump type floor drain should be 12 square feet.	30 (81%)	5 (13%)	2 (5%)
14. Exhaust system is used for removal of welding fumes in the laboratory.	1 (2%)	15 (40%)	21 (56%)
15. A dust collection system is used in the laboratory.	35 (94%)	0	2 (5%)
16. Drainage, Exhaust and Dust Collection Systems TOTAL	31 (84%)	3 (8%)	3 (8%)
Electrical and Compressed Air Systems			
17. Laboratory lighting for work areas is 80 foot candles.	35 (94%)	0	2 (5%)
18. The laboratory has at least 4 compressed air outlets.	26 (70%)	2 (5%)	9 (24%)
19. The laboratory has electric overhead bus ways.	4 (11%)	33 (89%)	0
20. Electrical and Compressed Air Systems TOTAL	27 (73%)	10 (27%)	0
Laboratory Area			
21. Laboratory size is at least 3200 square feet.	24 (64%)	0	13 (35%)
22. Laboratory space per student is 140 square feet.	27 (73%)	0	10 (27%)
23. Laboratory open floor space is 1700 square feet.	24 (64%)	0	13 (35%)
24. Laboratory width to length ratio is 1:1.5-2.	16 (43%)	19 (51%)	2 (5%)
25. Laboratory ceiling height is 17 feet.	36 (97%)	0	1 (2%)

Table 1 -- Continued

Standard	Number of schools Did not meet standard	Met standard	Exceeded standard
26. Laboratory width is 40 feet.	17 (45%)	8 (21%)	12 (32%)
27. Laboratory overhead door width is 17 feet.	33 (89%)	0	4 (11%)
28. Laboratory overhead door height is 14 feet.	32 (86%)	5 (2%)	0
29. Laboratory has 2 service doors.	2 (5%)	16 (43%)	19 (51%)
30. Laboratory workbench lengths do total 100 feet.	30 (81%)	6 (16%)	1 (2%)
31. Laboratory tool storage area is 140 square feet.	8 (21%)	22 (59%)	7 (19%)
32. Laboratory Area TOTAL	29 (78%)	2 (5%)	6 (16%)
Student Numbers and TOTAL			
33. Laboratory class size is limited to no more than 20 students.	5 (13%)	1 (2%)	31 (84%)
Housekeeping Area			
34. There is laboratory storage provided for students' coveralls and glasses.	0	14 (37%)	23 (62%)
35. There is adequate storage for brooms and other cleaning equipment.	4 (11%)	31 (84%)	2 (5%)
36. Laboratory tools and equipment are organized to provide for ease of use and daily inventory.	1 (2%)	32 (86%)	4 (11%)
37. Laboratory floor is well maintained	11 (29%)	14 (37%)	12 (32%)
38. Laboratory supplies are stored in a systematic and safe manner.	11 (29%)	26 (70%)	0
39. There are maintenance and service records of electrical power equipment on file in the departmental office.	33 (89%)	2 (5%)	2 (5%)
40. The laboratory is maintained in an orderly, safe, and attractive condition.	13 (35%)	24 (65%)	0
41. Housekeeeping Area TOTAL	18 (49%)	12 (32%)	7 (19%)

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FREQUENCY AND IMPORTANCE OF MECHANICAL ACTIVITIES PERFORMED BY OUTSTANDING YOUNG FARMERS IN MISSISSIPPI

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INTRODUCTION

The tenet of vocational agriculture is occupational relevance. Our mission..."shall be to fit for useful employment, ...and shall be designed to meet the needs of persons...who are preparing for a trade or industrial pursuit or who have entered upon the work of a trade or industrial pursuit;" (Smith-Hughes, 1917). There have been significant changes in the workplace and these must be reflected in the curriculum. Agricultural change seldom occurs through a revolution in practice. Rather, change occurs through a constant, often tedious evolution. Research adds to what is known and should be consistent with the founding principles of the program. A task force of the American Vocational Association (1981) developed a national agenda for vocational education. They found remaining current was a major concern among vocational educators. Compounding this concern, Naisbitt (1982, p. 24) reported "scientific and technical information now increases 13 percent per year, which means it doubles every 5.5 years. But the rate will soon jump to perhaps 40 percent per year... data will double every twenty months." Vocational agriculture faces a challenge to meet the needs of agricultural industry. Swanson, Nelson and Meyer (1969) warned us that curriculum content rapidly becomes obsolete and should be changed as needed. Rawls (1980, p. 5) outlined seven bases for change including..."Linking the curriculum directly to the occupation could mean that employability of completers is better and that the need for the program can be more clearly defined."

There is a large data-base describing the competencies which should be included in a vocational agriculture program. Byram (1929) surveyed 175 master farmers from ten midwestern states in an effort to identify jobs that vocational agriculture teachers should include in the program. McClay (1978, p.1) directed a "national study for identifying and validating essential agricultural competencies needed for entry and advancement in major agriculture and agribusiness occupations." This study was conducted by agricultural educators in forty colleges and universities in the United States.

Weston (1959) conducted a study of mechanical jobs performed by selected farmers in Missouri. The survey instrument included five categories: farm power and machinery, farm buildings and conveniences, soil and water management, electrification, and farm shop. Knott (1971) used the same categories to survey the mechanical skills needed by farmers in Texas. Shinn (1977) conducted a staff study of Missouri young farmers using the instrument from the Weston study. Long (1981) compared the agricultural mechanic activities performed by selected young farmers and vocational agriculture instructors in Missouri.

The paper was prepared for presentation at the National Agricultural Education Research Meeting, New Orleans, LA, November 30, 1984.

PURPOSE AND OBJECTIVES

Replication of foundation research is necessary to re-test and validate current practice. This staff study was designed as a quasi-replication of the research of Weston (1959) and Long (1981) to evaluate current practice among young farmers. The primary research question was "what are the important mechanical tasks which are performed by successful young farmers?" Specifically, three research questions were framed:

1. What mechanical tasks are performed on farms owned or operated by successful young farmers in Mississippi?
2. Among those tasks performed, what is the level of importance as perceived by successful young farmers?
3. Does the nature of farming operations affect the importance or the frequency of the performed tasks?

PROCEDURES

This descriptive study surveyed young farmers who were selected by local Jaycee chapters to participate in the Outstanding Young Farmer awards program. As defined, an Outstanding Young Farmer is between the ages of 18 and 35 and has demonstrated superior knowledge in their farming community worthy of recognition. The population included 82 young farmers who were selected by local chapters during the period from 1977 through 1982. A sample of 50 was randomly selected. An individualized cover letter, survey instrument, demographic data sheet and a stamped return envelope was mailed on February 14, 1983. One follow up letter was sent to the non-respondents on February 28. Attempts were made to telephone the remaining non-respondents during the week of March 14. Thirty-seven usable instruments (74%) were returned prior to April 1, 1983.

Instrumentation

The list of mechanical activities was adapted from the instrument used by Long (1981). It consisted of 108 competencies which were subdivided into five parts: farm power and machinery (33), construction and maintenance (29), structures and environment (22), electric power and processing (12), and soil and water management (12). Respondents were asked if the activity was performed on their farm. If yes, a rating from 1 to 6 was assigned indicating the importance to the success of the operation. Respondents had the opportunity to list those activities which were important but not included at the end of each section. All mechanical activities were included in Tables 9 through 11.

Data Analysis

The 37 respondents were divided into three sub-groups: those with both crop and livestock enterprises (22), those with only crop enterprises (10), and those with only livestock enterprises (5).

The data from the returned instruments were transferred to code sheets and key punched by the researchers. The data were analyzed using the Statistical Package for the Social Sciences (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975) at the Thomas E. Tramel Computing Center on the campus of Mississippi State University. Means and standard deviations were computed for each mechanical activity by sample and by each of the three enterprise sub-groups. Demographic data were summarized for each of the enterprise sub-groups.

RESULTS

A summary of the demographic data was included as an introduction to the sample of Outstanding Young Farmers. They were typically in the upper age range (31.5) of the population, involved in a single proprietorship, and managed a total of approximately 54,000 acres of owned and rented land. Those with crop enterprises farmed soybeans, cotton, and wheat. Beef cattle was most frequent among the 20 livestock producers (54%). The majority of the sample had earned a bachelors degree and managed 2.3 full time and 1.6 part time employees.

Age

The mean age of the respondents was 31.5 years. The mean age of those with both crop and livestock enterprises was 32.3 years while those with crop enterprises had a mean age of 32.0 years. The mean age of those with livestock enterprises was 27.2 years. See Table 1 for a description of age of the sample and the sub-groups by enterprise.

Table 1

Age of Outstanding Young Farmers by Enterprise

Enterprise	Age	Range	n
Both Crop and Livestock	32.3	27 - 38	22
Crop Only	32.0	27 - 36	10
Livestock Only	27.2	18 - 38	5
All	31.5	18 - 38	37

Nature of Business

Twenty-four young farmers (65%) described their operation as a single proprietorship. This was the most common type of business among each of the three sub-groups. The partnership was second most common (36%) among operations with both crop and livestock enterprises. See Table 2 for a description of the nature of the farm business.

Table 2

Nature of Business of Outstanding Young Farmer by Enterprise

Enterprise	Single Proprietorship	Partner	Family	Total
Both Crop and Livestock	13	8	1	22
Crop Only	7	1	2	10
Livestock Only	4	0	1	5
All	24	9	4	37

Land Management

There was a broad range in the number of acres of both owned and rented land among young farmers in Mississippi. The 37 young farmers managed an average of 1,460 acres with a mean of 697 acres owned and 763 acres rented. Those with crop enterprises reported managing 1,763 acres with 916 acres owned and renting 847 acres. Those with both crop and livestock enterprises reported a total of 1,598 acres with 733 acres owned and 863 rented acres. See Table 3 for a description of nature of land management by young farmers.

Table 3

Land Managed by Outstanding Young Farmers by Enterprise

	Owned		Rented	
Enterprise	M	Range	M	Range
Both Crop and Livestock	733	0 - 5000	863	0 - 3000
Crop Only	916	0 - 5000	847	50 - 1700
Livestock Only	101	0 - 240	180	120 - 240
All	697	0 - 5000	763	0 - 3000

Type of Enterprise

Soybeans was the most frequent crop grown among the 37 young farmers (94%). Beef cow and calf operations were most frequent as reported by 20 livestock producers (54%). Fourteen young farmers produced wheat and cotton, however cotton enterprises involved more acres. Five armers reported a hog or dairy enterprise. Broiler and catfish enterprises were each reported by one young farmer. Mississippi Outstanding Young Farmers had a diversity of farming enterprises. See Table 4 for a description of the type and size of enterprises.

Table 4

Type and Size of Farming by All Enterprises

Enterprise	M Acres	M Head	Range	n
Soybeans	689		100 - 2200	30
Timber	578		40 - 2000	4
Cotton	519		100 - 1600	14
Wheat	318		50 - 900	14
Pasture	325		300 - 350	2
Corn	196		50 - 600	4
Milo	166		50 - 300	5
Hay	128		55 - 200	2
Beef		161	9 - 500	20
Dairy		214	65 - 400	4
Hogs		112	50 - 200	4
Catfish	300		300	1

Educational Level

When asked about educational preparation, all reported high school completion, two reported additional vocational training, six completed two years of college and nineteen of the 37 respondents (51%) reported a baccalaureate degree or higher. Those with a degree reported major fields of study in agricultural and extension education, agricultural economics, agricultural engineering, animal science, forestry, entomology, industrial education, business, history, psychology, and social work. Associate degrees were reported in business and physical education. See Table 5 for a description of educational level by enterprise.

Table 5

Educational Level of Outstanding Young Farmers by Enterprise

Enterprise	H. S.	Vocational Training	2 yrs.	4 yrs.	Plus
Both Crop and Livestock	4	1	4	12	1
Crop Only	3	0	2	5	0
Livestock Only	3	1	0	0	1
All	10	2	6	17	2

Farm Labor Employment

Young farmers with both crop and livestock enterprises reported a mean of 2.6 full time and 1.3 part time employees in their farming operations. Those with crop enterprises reported a mean of 2.1 full time and 3.0 part time employees. Livestock producers reported 1.8 full time and 0.2 part time employees. The range of employment for the thirty-seven young farmers way 0 - 15 full time and 0 - 6 part time employees. The 400 cow dairy operation reported the most farm labor. See Table 6 for additional information regarding farm labor employment.

Table 6

Farm Labor Employment of Outstanding Young Farmers by Enterprise

Enterprise	Full Time		Part Time	
	M	Range	M	Range
Both Crop and Livestock	2.6	0 - 15	1.3	0 - 3
Crop Only	2.1	0 - 9	3.0	2 - 6
Livestock Only	1.8	0 - 5	0.2	0 - 1
All	2.3	0 - 15	1.6	0 - 6

Note. In the full time category, the crop only and all enterprise groups had one case missing.

Power and Machinery Activities

The central issue of this study dealt with the frequency and importance of mechanical tasks performed by successful young farmers. The 33 activities were rank ordered using the means of each activity. For these analyses, an arbitrary cut-off was established at the 3.0 level. Twenty-seven of the power and machinery activities (82%) were rated above the cut-off value. Approximately one-half of the activities dealt with the farm tractor while the remainder involved tractors, implements, and machinery.

When compared with the sample, those with both crop and livestock enterprises rated the diagnosis of diesel injector pump problems higher. This sub-group rated maintenance and repair of fuel delivery systems below 3.0. The crop only sub-group rated overhaul of gasoline engines higher than the sample. However, this sub-group rated maintenance and repair of the fuel system lower than the cut-off value. The five young farmers included in the livestock only sub-group rated 10 of the 27 activities (44%) below the cut-off score. These included tractor adjustment, tire repair and spray painting farm machinery and equipment. Table 7 provides a listing of the 33 power and machinery activities included in the study.

Table 7

Means of Power and Machinery Activities Performed
by Outstanding Young Farmers by Enterprise

Original Item	Mechanical Activities	All	Both	Crop	Live-stock
2	Change crankcase oil and filter	5.8	5.8	6.0	5.6
10	Service air cleaner	5.7	5.7	5.7	5.4
30	Cal & Adj Plant equip	5.6	5.7	6.0	4.6
1	Lube tractor	5.5	5.5	5.8	5.4
33	Cal spray equip	5.5	5.8	6.0	3.4
31	Adj harvest equip	5.5	5.8	6.0	3.4
29	Adj implements	5.5	5.5	5.4	5.4
19	R&R broken machine parts	5.4	5.5	5.2	5.4
32	Adj tillage equip	5.3	5.2	5.9	4.4
15	Maintain batteries	4.9	4.8	5.1	4.8
28	Maintain farm trucks	4.8	5.0	4.3	5.0
11	Maintain cooling sys	4.8	5.0	5.1	3.4
9	Repack wheel bearing	4.6	4.9	5.0	2.6
7	Adj clutch	4.3	5.1	3.6	2.4
21	Maint hydraulic sys	4.2	4.1	4.2	4.6
12	Maint safety devices	4.0	3.9	4.4	3.6
24	Troubleshoot diesel eng	3.9	3.8	4.0	4.2
23	Troubleshoot gas eng	3.8	3.8	4.0	3.8
8	Adj brakes	3.8	4.1	3.6	2.4
25	Maint exhaust sys	3.6	3.9	3.5	2.8
3	Tune-up gas engine	3.6	3.7	3.8	2.4
5	Maint & repair fuel sys	3.6	4.0	2.9	2.8
22	Adj & repair gas engine	3.4	3.4	3.7	2.6
26	Repair tire	3.3	3.9	3.6	0.2
16	Repair electrical sys	3.3	3.4	3.2	3.2
20	Paint machines & equip	3.1	2.9	3.8	2.6
14	Size pulleys & belts	3.0	2.8	3.7	2.4
6	Diagnose diesel pump	2.9	3.1	2.7	2.4
17	Overhaul gas engines	2.5	2.8	3.1	0.0
13	Maint & repair air cond	2.0	1.7	2.7	1.2
4	Tune-up diesel engines	1.9	1.7	3.1	0.0
27	Install radio equip	1.9	2.2	1.6	1.0
18	Overhaul diesel engine	1.6	1.5	2.4	0.0

Construction and Maintenance Activities

Twenty-two of the 28 activities (88%) were judged important by the sample of young farmers. This listing included competencies in materials selection, general safety, arc welding, gas welding and cutting, tool redressing, and fence repair. There was some disagreement between the sample and young farmers who were involved with both crop and livestock enterprises. This sub-group of 22 rated maintenance of hand power tools and maintaining tool inventories as less important. Young farmers who were involved with crop enterprises rated four activities lower than the sample; repair of fences, construction of corrals and fences, and construction of both wood and metal projects. They rated the use of spray painting equipment higher than the sample. Table 8 lists the means of construction and maintenance activities as perceived by young farmers in Mississippi.

Table 8

Means of Construction and Maintenance Activities Performed by Outstanding Young Farmers by Enterprise

Original Item	Mechanical Activities	All	Both	Crop	Livestock
18	Arc welding	5.1	5.2	5.7	3.8
17	Oxy-acetylene cutting	5.0	5.0	5.7	4.0
13	Operate equip safely	5.0	5.1	5.2	4.4
14	Follow safety proc	5.0	4.7	5.7	5.2
7	Use hand tools safely	4.9	4.7	5.2	5.0
10	Maintain shop equip	4.3	4.2	4.7	4.0
16	Oxy-acetylene welding	4.3	4.0	5.3	3.6
9	Determine materials	4.1	4.2	4.7	4.0
25	Maint-Repair fence	4.1	4.8	2.6	4.4
23	Maint farm serv center	4.1	3.8	4.9	3.4
22	Select weld supplies	4.1	3.9	5.0	3.0
26	Constr corral-fence	4.0	4.6	2.1	4.8
29	Sharpen machine blades	4.0	3.8	4.4	4.0
2	Construct devices	3.8	3.6	4.6	3.8
21	Select weld supplies	3.8	3.6	4.7	3.0
1	Maint farm shop	3.7	3.4	4.1	3.8
3	Constr metal project	3.5	3.7	2.4	3.6
4	Constr wood project	3.4	3.3	2.6	4.0
5	Sharp drill bit, etc.	3.4	3.5	3.6	3.8
15	Maint tool inventory	3.3	2.8	4.2	3.2
6	Maint hand power tool	3.2	2.7	3.9	4.2
12	Use spray paint equip	2.4	2.0	3.7	1.6
27	Constr farm implement	2.4	2.0	3.1	2.4
28	Constr trailer-wagon	2.1	1.9	2.6	2.2
24	Rope knots, halters	1.9	1.8	2.1	2.2
8	Make project drawing	1.6	0.7	2.7	3.2
19	MIG welding	0.5	0.5	1.0	0.0
11	Maintain paint room	0.5	0.4	1.3	0.8
20	MIG welding	0.3	0.1	0.9	0.0

Structures and Environment Activities

Using the consensus of 37 young farmers, six of the 22 structures and environment activities (27%) were above the cut-off value of 3.0. The areas included selecting materials, building maintenance, and light construction. There was general agreement between the sample and young farmers with both crop and livestock enterprises. Young farmers who grew crops only rated repair and maintenance of grain or forage handling equipment lower than the sample. The maintenance of water wells and pumps planning farmstead layout were identified as an important activity by the livestock sub-group. This sub-group rated repair and maintenance of grain/forage handling equipment, selection of materials to construct farm buildings and construction of small farm buildings lower than the sample. Table 9 provides a listing of the structures and environment activities and the mean values.

Table 9

Means of Structures and Environment Activities Performed By Outstanding Young Farmers by Enterprise

Original Item	Mechanical Activities	All	Both	Crop	Livestock
18	Maintain farm bldg	4.4	4.0	4.8	4.6
8	Instl water line/fixt	3.8	3.9	3.6	4.2
19	Maint & repair grain forage handl equip	3.4	3.8	2.8	3.2
17	Constr small farm bldg	3.3	3.5	3.0	3.0
9	Install plumb fixture	3.2	3.3	2.8	3.8
2	Select bldg materials	3.0	3.0	3.1	2.8
3	Constr concrete forms	2.6	2.6	2.6	2.8
1	Layout farmstead	2.5	2.1	2.9	3.0
11	Maintain well & pump	2.5	2.3	2.3	3.4
16	Constr major farm bldg	2.4	2.6	2.2	2.0
22	Install/maint grain augers	2.1	2.3	1.5	2.0
4	Determine concrete	2.0	1.7	2.0	2.8
6	Mix concrete	1.8	1.8	2.5	0.4
5	Finish concrete	1.8	1.8	2.0	1.4
20	Erect bins & storage	1.7	2.0	1.4	0.8
10	Maint septic tank sys	1.7	1.8	1.2	2.0
21	Install/maint grain dry equip	1.5	1.8	0.6	0.0
12	I/M LP-gas lines	1.3	1.3	1.2	1.2
7	Install bldg vent sys	0.7	0.7	0.5	1.0
14	Use solar for heat	0.2	0.2	0.2	0.0
13	Maint bldg air cond	0.1	0.1	0.2	0.0
15	Constr solar heat sys	0.0	0.0	0.0	0.0

Soil and Water Management Activities

Four activities were identified as important by young farmers in the sample. These included determining field size and acreage, estimating and considering the slope of a field in planning its use, layout of terraces and waterways and the construction of terraces and waterways. There were differences between the sample and those young farmers in the crop sub-group. Crop farmers rated three additional activities as important to their operations; using land leveling equipment, using the farm level, and planning and installing field drainage systems. Additional information related to the importance of soil and water management activities is included in the Table 10.

Table 10

Means of Soil and Water Management Activities Performed by Outstanding Young Farmers by Enterprise

Original Item	Mechanical Activities	All	Both	Crop	Livestock
1	Determine field size and acreage	4.9	4.7	5.3	4.6
9	Estimate slope and consider in plan	3.0	4.0	5.3	2.4
2	Layout terraces and waterways	3.8	3.2	5.0	4.2
3	Constr terraces and waterways	3.8	3.1	5.1	4.0
12	Plan/install drain	2.7	2.6	4.3	0.0
10	Use land level equip	2.0	1.0	4.9	1.2
11	Use farm level	2.0	1.0	4.9	1.2
4	Locate farm pond	1.9	1.8	2.2	2.2
5	Constr farm pond	1.7	1.7	1.9	1.2
6	Irrigate crop-past	1.1	0.5	2.6	1.0
8	Maint irrig sys	1.0	0.2	2.6	1.0
7	Install irrig sys	0.5	0.0	1.4	1.0

Electric Power and Processing Activities

None of the 12 activities listed in this category were rated by the sample as important to their farming operation. There were practical differences among the sub-groups. Young farmers with only crop enterprises rated the use of the National Electric Code as an important activity. The five young farmers in the livestock sub-group identified planning electrical wiring needs, selecting electrical wiring supplies, and installing interior wiring as important activities. Table 9 lists the mean values of all electric power and processing activities included in the study.

Table 11

Means of Electric Power and Precessing Activities
Performed by Outstanding Young Farmers by Enterprise

Original item	Mechanical Activities	All	Both	Crop	Live-stock
5	Install main & breaker	2.4	2.0	2.9	3.7
2	Select elec supplies	2.1	1.8	2.4	3.0
3	Install interior wire	2.0	2.0	1.6	3.0
11	Install ground equip	2.0	1.7	2.7	2.0
1	Plan wiring needs	1.9	1.7	1.9	3.0
4	Install service wire	1.8	1.5	2.2	2.5
8	Select/install motor and controls	1.7	1.7	2.2	2.2
7	Use the NEC code	1.6	0.9	3.7	1.0
9	Service motors	1.5	1.4	1.6	2.0
12	Locate distrib conter	1.4	1.1	1.9	2.0
10	Select heat/cool equip	1.0	0.4	1.9	2.0
6	Sketch circuits	0.7	0.4	1.2	0.8

CONCLUSIONS

Outstanding Young Farmers were concerned about mechanical practices on Mississippi farms and ranches. This was demonstrated by a 74% return on a mailed questionnaire and the assigned values to selected activities on the instrument. The sample of 37 Outstanding Young Farmers rated the 33 power and machinery activities highest among the five categories with a grand mean of 4.0 on a six point scale. Twenty-seven activities (82%) had individual mean scores of 3.0 or higher by all respondents. Mississippi and Missouri Young Farmers (Long, 1981) were compared using a rank difference correlation (Tate, 1965). Activities in the power and machinery category were positively correlated (r = + .95). There were no significant differences between the two groups as they perceived the importance of power and machinery activities.

Construction and maintenance activities received the second highest grand mean (3.4). Twenty-one of the 29 activities (72%) received a mean of 3.0 or higher by the sample. Mississippi and Missouri Young Farmers were in agreement as to the priorities of the list as demonstrated by a rank difference correlation of + .92.

The third highest grand mean among categories was soil and water management with a grand mean of 2.4 on the 12 activities. One fourth of the list received a value of 3.0 or higher by all respondents. The 10 young farmers with only crop enterprises rated three additional activities above the cut-off score. A comparison of Mississippi and Missouri Young Farmers resulted in a rank difference correlation of + .88.

Six of the 22 structures and environment activities were included above the cut-off score of 3.0 by young farmers. The grand mean of this category was 2.1. Mississippi Young Farmers rated these activities somewhat lower than their Missouri counterparts, however, they agreed on the rank order of the list. The rank difference correcation was +.87. between the two groups.

Activities in electric power and processing were rated lowest of the five categories in this study. The grand mean of the twelve activities was 1.68 on a six point scale. The sample did not identify any activity as important to their farming operation when the cut-off score was used for decision making. The young farmers from Mississippi and Missouri did agree on the rank order of the activities (r = + .83).

Mechanization has had a signigicant impact in the agricultural industry. A futuring project commissioned by Production Credit Associations of America (1983, p. 115) predicted "by the year 2000, the trend toward increased farm mechanization will have increased in... tractors and engines, tillage and planting, crop harvesting and storage, remote sensing, and robots." The authors expected evolutionary development to continue. The reminded us that "new technologies will continue to be tested by a relatively small number of innovators before gaining wide-spread commercial acceptance." We may use this sample of 37 Outstanding Young Farmers as an advisory group to select mechanical activities to include in production agriculture programs. They identified 59 activities with a value of 3.0 or higher on a six point scale. This list should serve as the benchmark on which local programs build curriculum. We must continue, even expand, our efforts to describe current practices among innovators. The replication of foundation descriptive research help us renovate curriculum and will yield solid returns.

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DISCUSSION OF THEME
AGRICULTURAL MECHANICS INSTRUCTION*

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Topic I: A Model of Variables Influencing Safety Attitudes of Agricultural Mechanics Students

As the authors of this paper suggest, safety in agricultural mechanics deserves attention. Too often, however, this attention is directed only to "safety knowledge" rather than to "safety attitudes." To "counteract" this tendency, the researchers conducted this study to delve into safety attitudes by identifying relationships between safety attitudes and selected variables anticipated (by the authors) to be related to those safety attitudes.

How were they most successful? By using a range of subjects, the researchers might generalize the results to a wide population--secondary, post-secondary, and higher education students. Similarly, by using a conceptual model incorporating all the selected variables, the researchers were able to identify the unique contribution of each selected variable to the explanation of the criterion variable--attitudes toward safety. Finally, using empirical evidence to test their conceptual model, the researchers were able to "fine tune" their model--resulting in a new model with both conceptual _and_ empirical support.

These conceptual and procedural details, on the other hand, raise questions and concerns (as well as _answer_ questions). 1) The original conceptual model is presented without indication of its _source_. That is, what led the researchers to anticipate that the selected variables would be related to attitudes about safety? 2) The sampling involved four strata of students. Although this stratification of students was used as a predictor variable, I would have liked to see whether other selected variables were related differently to student attitudes _across_ strata. That is, were the relationships between student attitudes and selected variables within the secondary student group, for example, different than the same relationships within the post-secondary student group? (In other words, was there any _interaction_ between student level and other predictor variables?) 3) Also, the sampling technique involved cluster sampling within each stratum. The cluster sampling introduced a potential problem(s) of confounding and/or misuse of sampling units as experimental units. For example, one might wonder whether the reported relationship between type of school and student attitudes was really a relationship between type of teacher and student attitudes. We simply cannot determine from the paper how many "clusters" (classroom or teacher units) from each stratum were sampled. 4) Another unanswered question involves the independence among predictor variables. We were given the reliability for each of nine predictor variables. Too, we know the relationship between each predictor variable and the criterion variable. We do not know, though, the degree of relationship between predictor variables. That is, what empirical evidence is there that the predictor variables were, in fact, different variables? A matrix of correlation coefficients between pairs of predictor variables would answer this question. 5) Finally, in my opinion, the researchers may have stated their conclusions, recommendations, and implications with unwarranted (or at least, unexplained) zeal. For example, the researchers concluded that "there does appear to be an overall increase in safety attitude scores as students get older; [sic] into higher levels of education." None of the results presented in this paper can substantiate this conclusion. (I suspect, however, that the unreported descriptive data would support this conclusion.) Furthermore, several conclusions and recommendations state that various predictor variables influence the development of student safety attitudes. These conclusions may not be warranted conceptually or procedurally. That is, correlational techniques used with data generated non-experimentally do not establish cause and effect; given this limitation, then, only if predictor variables precede criterion variables chronologically can cause and effect be inferred. In this study, it is difficult to determine if the best predictor of student safety attitudes (i.e., student's perception of his/her teacher's safety knowledge) really had a causal influence on these attitudes.

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*Discussion of 3 papers presented at the National Agricultural Education Research Meeting, New Orleans, Louisiana, November 30, 1984.

This research does contribute considerably to our knowledge of the relationships between student attitudes and selected variables. It should serve as a valuable "springboard" for additional research into factors causing student attitudes toward safety. And, ultimately, I suspect the researchers hope that safe attitudes can be developed which will in turn lead to safe work.

Topic II: A Comparison of Existing Standards Found in Nebraska Secondary School Vocational Agriculture Mechanics Laboratories with Standards Developed on a National and Regional Level

The plethora of commissions, reports, legislation, and talk about excellence in education in the 80's--one might suspect--led to this research. Not true! This very practical effort was based on similar work from the 70's (or earlier). Standards for excellence--a "hot" topic--might be the theme for this study. More to the point... After developing systematically the standards for agricultural mechanics laboratories in Nebraska, the authors applied these standards to evaluate personally one-fourth of the agricultural mechanics laboratories in Nebraska. The findings of the researchers was distressing to them, I suspect! I applaud the efforts of the researchers for their contribution to an anticipated (by me) improvement in agricultural mechanics instruction in Nebraska!

Now, how might these efforts have been altered to ensure that instructional improvement does, in fact, result? 1) "The instrument was validated by a group of teacher educators..." I suspect that greater validity (or, perhaps more importantly, greater acceptability) would have resulted had Nebraska teachers and administrators been involved. 2) Similarly increased reliability (and acceptability) may have resulted from the completion of the instrument by the local teacher, administrator, and/or advisory committee member as well as the researcher. (This suggestion is made only for those standards open to obvious levels of subjectivity, for example, "non-skid material is used effectively.")

How might the paper be improved as well? 1) The reference to a Likert scale in the "Instrument Development" section should be removed. There were, quite simply, three ordinal response categories. Also, the summation of ratings within a "standard area" is meaningless at best, possibly inaccurate and counterproductive. For example, in the safety area, there are ten standards. For standard 7 (use of non-skid material), it is reported that none of the 37 schools met this standard. Yet the "Safety Area Total" (#11) showed that two schools met the "standard area." I suspect that this safety total is a kind of average of the ten individual standards. Applying this assumption, a school that exceeded one standard could have "not met" another standard; yet, for the "total area" (average), the school would have "met standard area." I suggest that "it don't work thataway" for standards! In my opinion, only if a school had at least "met standard" for each of the individual standards within an area would the facility then have "met standard" for that area. 2) The paragraph on possible causes for standards not being met should be removed from the "RESULTS" section. The suspected causes were not examined as part of the study; so, they should not be part of the results. 3) In the IMPLICATIONS section, more attention should be directed to the need for a follow-up of the evaluation of each local facility. If, in fact, the standards are important to high quality instruction in agricultural mechanics, then change is needed! This research should spur it on!

Perhaps the local schools (teachers, administrators, boards) need to be referred to A Guide for Implementing Standards for Quality Vocational Programs in Agricultural/Agribusiness Education (Agricultural Education Department, Iowa State University, c. 1978).

The results of this research activity can and should affect practice in agricultural education. In fact, ultimately, the research should improve practice. Little more should be expected of action research! Furthermore, it can serve as a reminder to all of us 1) to establish meaningful standards for excellence, 2) evaluate relative to those standards, and 3) change where needed to meet or exceed those standards--with the ultimate goal of achieving excellence.

Topic III: Frequency and Importance of Mechanical Activities Performed by Outstanding Young Farmers in Mississippi

One long-range purpose of this research was to improve the curriculum in agricultural mechanics by determining the important activities performed by innovative farmers. The researchers provided a literature review to substantiate their contention that curricular content in vocational agriculture should be based on the occupational activities that currently employed and innovative farmers are performing. Previous studies by the senior author and his co-workers indicate that this is part of a programmatic, on-going effort--an effort that has resulted in improved practice in the past and that should continue to do so.

This research effort identified successfully from 108 competencies a list of 59 activities rated by farmers at or above the midpoint on a linear scale. The researchers, then, labelled these 59 activities a "benchmark" on which local programs should build curriculum. So, with little doubt, the researchers have moved toward the goal of updating curriculum. In addition, they have described well the characteristics of select young farmers and of their farming operations. For each of the 108 activities, four importance level ratings are given--an overall importance level from all 37 respondents, an importance level from farmers of both crops and livestock, one from "crop only" farmers, and one from "livestock only" farmers. So, individual developers of curriculum have numerous data upon which to base their decisions of what is and what is not important.

Now, what suggestions might be offered or what concerns might be raised, or what questions are unanswered? 1) "The list of mechanical activities was adapted [emphasis added] from the instrument used by Long (1981)." One might infer that some activities from the Long instrument were deleted (as obsolete) while others (innovative activities) were added. It is not clear, however, to what extent updating was done. A simple statement of X number deleted and Y number added would have given us an indication of an attempt at currency. Also, the researchers indicated that "respondents had the opportunity to list those activities...important but not included...." No mention is made of whether or not any activities were added by the respondents. Again, perhaps one statement in the results could alleviate this concern. 2) Considerable data were collected describing the farmers and their farms. However, type of farming operation (crops and livestock, crop only, livestock only) was the only classification variable used in the presentation of the mean responses. Obviously, not all possible combinations of personal and situational variables could have been used. And, perhaps just as obvious was the reason for using type of operation only; nevertheless, I would have appreciated an explicit statement of this reason. 3) Finally, I raise a concern about the rationale given for using young farmers as the subjects; this concern relates to the literature cited: The introduction builds a strong case for the rapid growth of scientific and technical information and its impact on curricular obsolescence. Yet, the researchers sample young farmers already in the occupation, and they use current practices as the basis for curriculum for training people to enter the occupation in the future. Simply, the citation in the paper that the amount of scientific and technial information will double every 20 months does not support the use of presently-employed practitioners to develop new curriculum. Rather, it suggests that we should go nearer the source of the new information (if it is to be anything near current by the time it is applied!). In a similar vein, the researchers suggested that these outstanding young farmers were "innovators." Rogers (1982) and others who have studied adoption-diffusion and characteristics of adopter categories would probably challenge this suggestion. Research indicates that an "innovator" among farmers would not be the type of farmer who would be selected as an outstanding young farmer by a local Jaycee chapter.

This research--I believe--makes a good contribution to the knowledge of important activities in agricultural mechanics performed by farmers. More importantly, I believe it should serve as a benchmark for curricular improvement, just as the authors have suggested.

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THEME: CHARACTERISTICS OF AGRICULTURAL EDUCATORS

THE ACADEMIC ABILITY OF AGRICULTURAL EDUCATION GRADUATES COMPARED WITH OTHER AGRICULTURE, EDUCATION AND UNIVERSITY GRADUATES

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INTRODUCTION

The issue of teacher competence has recently received much attention from those within as well as from those outside the education profession. Recent studies have questioned the abilities of teachers and of those who aspire to teach. Colleges and universities are moving to increase minimum requirements for admittance into teacher training programs and several states now have various testing programs for teachers entering the profession.

The recent concern over the issue of teacher competence is not without precedent. In 1956 Whyte stated, "It is now well evident that a large proportion of the younger people who will one day be in charge of our secondary system are precisely those with the least aptitude for education of all Americans attending college." The Miseducation of American Teachers by Koerner issued a scathing indictment of teacher education in 1963. The decade of the 1970's focused on selecting the most qualified teachers from an increasing supply of college graduates. Schlechty and Vance (1983) suggested that the apparent oversupply of college educated teacher candidates in that decade who were willing to teach made teaching a selective occupation, since schools could choose from among the candidates.

Evidence suggests that historically teachers have not been drawn from that segment of the population with the greatest aptitude for academic ability. Studies completed during the 1940's, 1950's and 1960's consistently showed that students preparing to be teachers were less able academically than students preparing to enter other professions (Blum, 1947; Burnett & MacMinn, 1966; Mitzel & Dubnick, 1961). Studies such as one by Weaver (1979) and one by Vance and Schlechty (1982) have indicated that teachers are currently being drawn from the least academically able college students. Studies also indicated that of those who enter teaching, those who continue to teach are less academically able than those who do not continue to teach (Schlechty & Vance, 1981).

Critics of education and teacher education see these data as evidence that teacher quality is less than desirable, while defenders of the quality of teachers have questioned the assumption that academic ability is an accurate and dependable indicator of teacher success. Researchers such as Ducharme (1970), Greaves (1972), and Ferguson (1977) have found, however, that a positive relationship exists between academic ability and teacher competence. Specific measures of academic ability of the teacher, such as scores on verbal apptitude tests, have been associated with student achievement, and researchers such as Schlechty and Vance (1981, 1983) and Weaver (1978, 1979, 1981) have based their research on this assumption.

Schalock (1979) stated,

> Whatever else teaching may be, it is an intellectual enterprise. It presumes teachers to be knowledgeable and able to help others to become knowledgeable. It is not surprising therefore, that intelligence and academic ability have been looked to as likely predictors of success in teaching. (p. 370)

Schlechty and Vance (1981) stated that it is generally accepted that persons who score well on measures of academic ability have educational and job opportunities available to them that are not usually available to those who score poorly. They suggested that prospective teachers who do score well on measures of academic ability are more likely to choose careers other than teaching, either before entering the profession or shortly thereafter.

PURPOSE AND OBJECTIVES

In light of recent concern of the academic ability of teachers in general, the academic ability of teachers of vocational agriculture may also be in question. Are the most talented students in agriculture seeking or being recruited to the teaching profession,or do the best students elect to seek other career opportunities? If a disproportionate share of teachers is being drawn from the bottom quarter of graduating high school and college students, as the National Commission on Excellence in Education (1983) suggests, then the specualtion is easily made that the quality of vocational agriculture programs will decline as the quality of teacher declines. Knowledge of the present academic status of entering teachers would aid the profession in making rational decisions regarding the recruitment and retention of teachers.

The purpose of this study was to determine if the academic ability of agricultural education graduates was significantly different than the academic ability of other agriculture, education and university graduates. The objectives of this study centered around accepted measures of academic ability and were as follows:

1. Describe agricultural education graduates, other agriculture graduates, and secondary education graduates on their cumulative grade point average (GPA), high school GPA, high school percentile rank, ACT English scores, ACT math scores and ACT composite scores.

2. Determine if significant differences existed between agricultural education graduates, other agriculture graduates, secondary education graduates, and all university graduates on cumulative GPA, high school GPA, high school percentile rank, ACT English scores, ACT math scores, and ACT composite scores.

PROCEDURES

Population and Sample

The study included four populations in which all subjects were graduates of the Ohio State University, each holding traditional four-year Bachelor degrees, between the Summer Quarter of 1978 and the Spring Quarter of 1983. Each of three of these populations was represented by a random sample of students stratified by year. Stratification was necessary to provide for certain analyses not reported herein. The size of each sample was calculated using Cochran's (1977) formula for determining sample size.

The first population of 249 agricultural education graduates was represented by a sample of 105 graduates with a Bachelor of Science in Agriculture and a major in agricultural education. The second population of 2237 other agriculture graduates was represented by a sample of 160 graduates with a Bachelor of Science in Agriculture and a major in an area other than agricultural education. A sample of 155 graduates with majors in the College of Education which culminated in secondary school teaching certificates represented the third population of 1338 secondary education graduates. The fourth population was comprised of all 31,494 graduates of the Ohio State University who received four-year degrees during the period of interest. It should be noted that the first three populations are actually sub-populations of the university population.

Data for each subject in the three sample groups were collected from the records offices of the College of Agriculture and the College of Education on each characteristic of interest. Data for the University population were obtained in the form of population statistics from the Office of Planning Studies to be used as comparison data.

Data Analysis

Descriptive statistics were utilized to address specific objectives of the study. Analysis of variance was utilized to determine if significant differences existed between sample groups. The alpha level was set a priori at .05 and the Scheffe procedure was utilized. To compare the population with the sample groups, 95 percent confidence intervals were constructed around the sample means which were then compared with the population means to determine if the population means were within the upper and lower limits of the confidence intervals.

Because this study was descriptive in nature, it sought only to describe rather than to explain relationships between characteristics. The data were obtained from graduates of the Ohio State University between and including the summer quarter of 1978 and spring quarter of 1983. The generalizability of the results are limited on that basis. Because data were obtained for all individual subjects, non response error was not considered a problem. Realizing the potential error inherent in comparing sub-populations with a larger population, the 95 percent confidence intervals were utilized to alleviate the problem.

RESULTS

Cumulative Grade Point Average

The analysis of variance performed on cumulative grade point averages for the three sample groups revealed that a significant difference existed between the groups at an alpha of .05. Education graduates earned a mean grade point average of 2.96 calculated on the four point scale. Agricultural education graduates held a mean average of 2.81 and other agriculture graduates a 2.71. The Scheffe procedure indicated that the cumulative grade point average of education graduates was significantly higher than either of the other groups. However, no significance was found between the agricultural education and other agriculture graduates (Table 1).

University graduates held a mean cumulative grade average of 2.87. When 95 percent confidence intervals were constructed around the sample means, the average grade of university graduates was found to be significantly higher than the grade average of the other agriculture graduate group and significantly lower than that of education graduates. The mean cumulative grade point average of university graduates was not significantly different from that of agricultural education graduates (Table 2).

High School Grade Point Average

The mean cumulative high school grade point averages for each of the three sample groups are presented on Table 3. The analysis of variance procedure revealed no significant differences between the groups on this characteristic at the .05 alpha level. Data on this characteristic for the university population were not available.

High School Percentile Rank

The analysis of variance procedure revealed no significant differences at the .05 alpha level between the three sample groups on the characteristic high school percentile rank (Table 4). When 95 percent confidence intervals were constructed around the means of the samples, no significant differences were found to exist between the samples and the university population (Table 5).

ACT Scores

Tables 6, 8, and 10 show the means for each sample group on the American College Testing program ACT English, math and composite scores, respectively. No significant differences were found to exist between any of the sample groups on these characteristics.

When 95 percent confidence intervals were constructed around the mean English scores of the three sample groups, agricultural education, other agriculture, and education graduates were all found to have scored significantly lower than university graduates. These data are shown on Table 7.

The 95 percent confidence intervals for the mean ACT math scores of the samples are shown on Table 9. These data revealed no significant differences between university graduates and agricultural education graduates or other agriculture graduates on this characteristic. University graduates did, however, hold significantly higher math scores than did the education sample.

Table 11 illustrates that university graduates had ACT composite scores that were significantly higher than the scores of education graduates. The samples agricultural education graduates and other agriculture graduates did not differ significantly from the university population on this characteristic.

CONCLUSIONS

Previous evidence indicated that individuals who aspired to teach were less academically inclined than other college students (Weaver, 1979; Vance & Schlechty, 1982; National Commission on Excellence, 1983). This study did not find this to be true, particularly for agricultural education graduates, on several measures of academic ability. Agricultural education graduates were found to be not significantly different than other agriculture, secondary education, or university graduates on several measures and were found to be different than university graduates only on English scores. These findings suggest that agricultural education graduates were academically equal to university and other agriculture graduates.

These findings are not consistent with publically held beliefs or with the findings of other educational research. Further study should be done. Several of the strongest advocates for educational reform utilize data which disagree with these findings. This study and others which identify agricultural education graduates should become additional evidence in the educational reform issues.

A study by Miller (1984) found that faculty in the College of Agriculture held agricultural education majors in "lower regard" than other agriculture majors. These data indicate that agricultural education graduates are equal, if not superior, to other agriculture graduates on these measures of academic ability. It is the duty of all agricultural education professionals to make these findings known.

Table 1

Analysis of Variance of Cumulative Grade Point Average by Group

	Grade Point Average		
	Agricultural Education	Other Agriculture	Education
f	105	160	155
Mean	2.81	2.71	2.96
S.D.	.44	.459	.423

Source	df	SS	MS	F	
Between Groups	2	4.74	2.37	12.14	*
Within Groups	417	81.49	0.19		
Total	419	86.23			

* Significant at α = .05;
----- Means are significantly different

Table 2

Comparison of University Graduates with Agricultural Education, Other Agriculture and Education Graduates on Cumulative Grade Point Average

Group	Mean Cumulative GPA	95% Confidence Interval
University	2.87	
Agricultural Education	2.81	2.72 to 2.89
Other Agriculture	2.71	2.65 to 2.79*
Education	2.96	2.89 to 3.06*

* Significantly different from University mean

Table 3

Analysis of Variance of High School Grade Point Average by Group

	Grade Point Average		
	Agricultural Education	Other Agriculture	Education
f	105	160	133^a
Mean	3.20	3.11	3.13
S.D.	.466	.491	.553

Source	df	SS	MS	F
Between Groups	2	0.53	0.26	1.033
Within Groups	395	101.31	0.26	
Total	397	101.84		

$\alpha = .05$

[a] 22 missing values

Table 4

Analysis of Variance of High School Percentile Rank by Group

	High School Percentile Rank		
	Agricultural Education	Other Agriculture	Education
f	105	158[a]	140[b]
Mean	78.45	74.87	74.85
S.D.	16.87	17.77	20.04

Source	df	SS	MS	F
Between Groups	2	997.80	498.90	1.478
Within Groups	400	135012.12	337.53	
Total	402	136009.92		

$\alpha = .05$

[a] 2 missing values

[b] 15 missing values

Table 5

Comparison of University Graduates with Agricultural Education, Other Agriculture and Education Graduates on High School Percentile Rank

Group	Mean Percentile Rank	95% Confidence Interval
University	76.12	
Agricultural Education	78.45	75.18 to 81.71
Other Agriculture	74.87	72.08 to 77.64
Education	74.85	71.50 to 78.20

Table 6

Analysis of Variance of ACT English Score by Group

	ACT English Scores		
	Agricultural Education	Other Agriculture	Education
f	105	156[a]	136[b]
Mean	18.70	19.35	19.29
S.D.	5.02	4.29	4.14

Source	df	SS	MS	F
Between Groups	2	29.99	14.99	0.758
Within Groups	394	7789.69	14.77	
Total	396	7819.68		

$\alpha = .05$

[a] 4 missing values

[b] 19 missing values

Table 7

Comparison of University Graduates with Agricultural Education, Other Agriculture and Education Graduates on ACT English Score

Group	Mean ACT English Score	95% Confidence Interval
University	20.09	
Agricultural Education	18.70	17.73 to 19.68*
Other Agriculture	19.35	18.67 to 20.03*
Education	19.29	18.59 to 19.99*

* Significantly different from University mean.

Table 8

Analysis of Variance of ACT Math Score by Group

	ACT Math Scores		
	Agricultural Education	Other Agriculture	Education
f	105	156[a]	136[b]
Mean	22.02	21.75	20.24
S.D.	6.43	6.55	6.98

Source	df	SS	MS	F
Between Groups	2	237.92	118.96	2.672
Within Groups	394	17538.20	44.51	
Total	396	[illegible]76.12		

$\alpha = .05$

[a] 4 missing values

[b] 19 missing values

Table 9

Comparison of University Graduates with Agricultural Education, Other Agriculture and Education Graduates on ACT Math Score

Group	Mean ACT Math Score	95% Confidence Interval
University	22.54	
Agricultural Education	22.02	20.77 to 23.26
Other Agriculture	21.75	20.71 to 22.79
Education	20.24	19.06 to 21.43*

* Significantly different from University mean.

Table 10

Analysis of Variance of ACT Composite Score by Group

	ACT Composite Score		
	Agricultural Education	Agriculture	Education
	105	156[a]	137[b]
Mean	21.33	21.72	20.96
S.D.	5.04	4.53	4.63

Source	df	SS	MS	F
Between Groups	2	42.39	21.19	0.958
Within Groups	395	8736.66	22.12	
Total	397	8779.05		

$\alpha = .05$

[a] 4 missing values

[b] 18 missing values

Table 11

Comparison of University Graduates with Agricultural Education, Other Agriculture and Education Graduates on ACT Composite Score

Group	Mean ACT Composite Score	95% Confidence Interval
University	22.25	
Agricultural Education	21.33	20.36 to 22.31
Other Agriculture	21.72	21.00 to 22.43
Education	20.96	20.17 to 21.74*

* Significantly different from University mean.

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JOB VARIABLES RELATED TO INTERNAL MOTIVATION AS PERCEIVED BY PERSONS EMPLOYED IN SELECTED PROFESSIONAL OCCUPATIONS IN AGRICULTURE

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INTRODUCTION

The motivation of employees at the work place is important to public sector agencies and private enterprises which hire workers. Studies in education, psychology, sociology, management and public administration have tied low worker motivation to a number of personnel problems. Absenteeism, turnover, burnout and other personnel problems can exist in organizations in which worker motivation is low (Dunnette, Arvy & Banas, 1973; Locke, Sirota & Wolfson, 1976; Miskel, Defrain & Wilcox, 1980; Sergiovanni, 1967; Steers & Mowday, 1981).

Expectancy theory of motivation, according to Vroom (1964), classifies rewards into two groups: extrinsic rewards and intrinsic rewards. Extrinsic rewards include such things as salary, benefits and working conditions. Intrinsic rewards include feelings of accomplishment, achievement and personal development; they are generated by the work itself. Because most people place high value on intrinsic rewards acquired from their work, intrinsic rewards have great potential as motivators (Lawler & Porter, 1967).

If, through intrinsic rewards, the work itself can generate motivation, can a job be modified to enhance motivation? If so, what aspects of a job should be modified, and how can the potential for increasing motivation in a particular job be determined?

The job characteristics theory (Oldham & Hackman, 1980), models the process of internal (intrinsic) motivation. Five "core job characteristics" influence three "critical psychological states." The psychological states, in turn, determine "personal outcomes." Internal motivation is classified as a personal outcome. "Growth need strength" accounts for individual requirements for growth and development. "Context satisfactions" reflect satisfaction with compensation, job security, co-workers, and supervision. Growth need strength and context satisfactions act as moderating variables. Figure 1, on page 2, shows the theory graphically.

Employers of agricultural professionals have unique problems in determining which job characteristics, if subjected to modification, are most likely to enhance intrinsic motivation. First, professional workers have high expectations for intrinsic rewards from their work. Typically, professional employees have high levels of education, living standard

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and mobility; this results in adequate extrinsic rewards and increased emphasis on intrinsic rewards for needs fulfillment (Smith, 1977). Erlandson and Pastor (1981) found that teachers possess proportionally more higher order needs than workers in an industrial setting. Sergiovanni (1967) concluded that the greatest motivators for teachers were achievement, recognition and responsibility. These studies indicate that teachers, as a professional group, are unique concerning motivation and particularly responsive to intrinsic rewards. Therefore, employers need information on the perceptions of agricultural professionals concerning job characteristics related to intrinsic motivation.

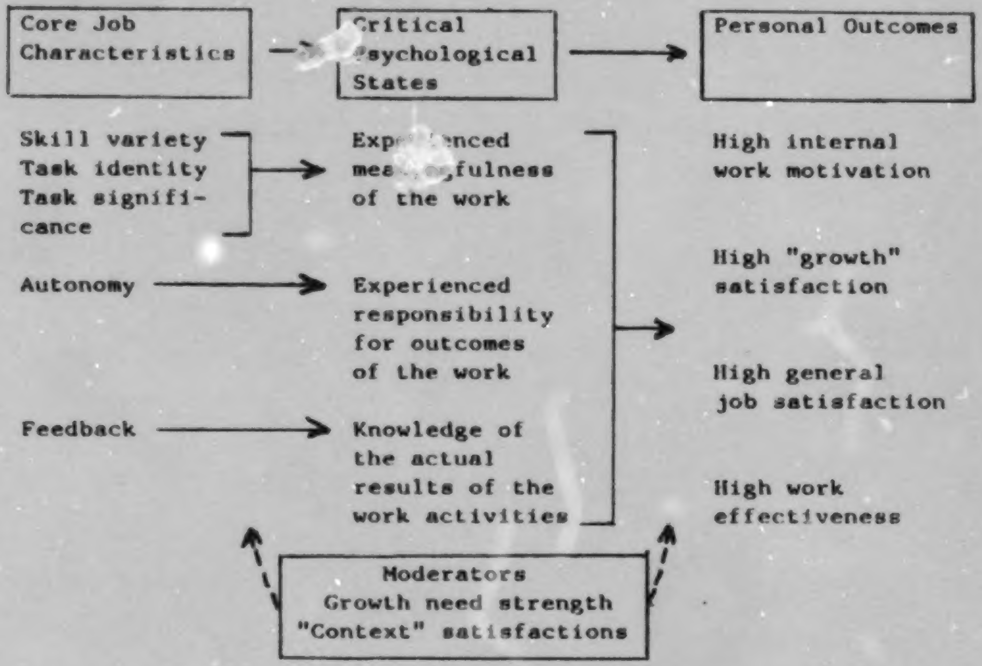
Core Job Characteristics
Critical Psychological States
Personal Outcomes
Skill variety
Task identity
Task significance
Experienced meaningfulness of the work
Autonomy
Experienced responsibility for outcomes of the work
Feedback
Knowledge of the actual results of the work activities
High internal work motivation
High "growth" satisfaction
High general job satisfaction
High work effectiveness
Moderators
Growth need strength
"Context" satisfactions

Figure 1. The job characteristics theory of work motivation (Hackman & Oldham, 1980, p. 90.)

Texas public school administrators in particular have had difficulty in retaining professionals teaching vocational agriculture. In 1981, the turnover rate among vocational agriculture teachers was 12.7 percent nationally and 19.9 percent in Texas. Also, in 1981, of 98 vocational agriculture positions which went unfilled nationally, 33 were in Texas (Craig, 1982). Hogue, Carnes and Briers (1981) found that 55 percent of the vocational agriculture teachers in Texas had ten or fewer years experience in the profession and 33.5 percent had five or fewer years experience in the profession.

McCracken, Smith and Saundi (1982) suggested that absenteeism and turnover among cooperative extension agents can diminish the effectiveness of cooperative extension organizations and that turnover among vocational agriculture teachers and cooperative extension agents interrupts services in local communities. They further suggested that if such organizations are to be most effective, managers and administrators should minimize absenteeism, turnover and similar personnel problems. Because motivation is related to personnel problems, organizations which hire agricultural professionals should provide work environments which enhance motivation.

Prior to implementing strategies aimed at enhancing internal motivation, employers require a basis for decision making. An analysis of job variables that influence internal motivation should provide information concerning: (a) the potential of a job for enhancing internal motivation--motivation potential score, (b) the potential of employees for reacting positively to job modifications--growth need strength and context satisfactions, and (c) the potential of specific job variables for enhancing internal motivation--core job characteristics (Hackman & Oldham, 1976). If professional agricultural jobs might enhance internal motivation, and if agricultural professionals have potential for reacting positively to job modifications, what job characteristics have potential for enhancing internal motivation?

PURPOSE AND OBJECTIVES

The purpose of the study was to determine which job characteristics have potential for enhancing intrinsic motivation among individuals in selected professional occupations in agriculture.

The specific objectives of the study were:

(1) To identify the perceptions of two groups of agricultural professionals toward selected job variables related to internal motivation.

(2) To compare the perceptions of two groups of agricultural professionals toward selected job variables related to internal motivation.

(3) To determine the relationships between selected job characteristics and the critical psychological states across two professional jobs in agriculture.

(4) To determine the relationships between the critical psychological states and internal motivation across two professional jobs in agriculture.

PROCEDURES

The Job Diagnostic Survey (JDS), developed by Hackman and Oldham (1975), was selected as the instrument for the study. The JDS measures employee perceptions of each variable associated with the job characteristics theory. Oldham, Hackman and Stepina, (1979), found the JDS job characteristic scale reliabilities to be more than adequate when average scores are used. Internal consistency reliabilities for JDS scales ranged from .58 to .88 (n = 6,930).

Definitions of the job characteristics (Hackman & Oldham, 1980) measured by the JDS, and presented in Figure 1, are given below.

Core Job Characteristics. Measures of five core job characteristics are provided by the JDS.

Skill Variety. The diversity of activities, skills and talents associated with a job.

Task Identity. The extent to which a job allows the completion of a whole product or identifiable outcome.

Task Significance. The level of impact which a job has on the lives and work of other people.

Autonomy. The amount of freedom a job allows for employee determination of work schedules and procedures.

Feedback from the Job Itself. The degree to which work activities provide direct information to the employee about his or her work performance.

Other Job Characteristics. Measures of two additional job characteristics, which have proven useful in understanding jobs, are provided by the JDS.

Feedback from Agents. The degree to which supervisors and co-workers provide direct information to the employee about his or her work performance.

Dealing with Others. The extent to which a job requires the employee to work with other people, both internal and external to the organization.

Critical Psychological States. Figure 1 shows three critical pyschological states mediating between the core job characteristics and the personal outcomes. Measures of these mediating variables are provided by the JDS.

Experienced Meaningfulness. The extent to which the employee finds a job to be valuable and worthwhile.

Experienced Responsibility. The level of personal accountability the employee feels for his or her work.

Knowledge of Results. The degree to which the employee is informed, on a continuous basis, of his or her work performance.

Personal Outcomes. Measures of three personal outcomes or employee reactions to a job are provided by the JDS.

General Satisfaction. The extent to which the employee is pleased with a job, overall.

Internal Work Motivation. The amount of self-motivation the employee directs toward effective work performance. When work performance is effective, the employee with high internal work motivation experiences positive internal feelings. When work performance is low, he or she experiences negative internal feelings.

Growth Satisfaction. The extent to which the employee is pleased with opportunities for personal growth and development in a job.

Satisfaction with the Work Context. Measures of four satisfactions with the work context are provided by the JDS. Context satisfactions reflect employee reactions to aspects of a job which do not directly involve the work itself: (a) job security, (b) compensation, (c) co-workers and (d) supervision.

Growth Need Strength (GNS). GNS accounts for employee growth and development needs, and predicts employee reactions to a job high in motivating potential. GNS should be high for individuals who would react positively to a job with high scores in the core job characteristics--individuals with low GNS would exhibit a diminished reaction.

Two Texas populations, teachers of vocational agriculture (VATs) and cooperative extension agents in agriculture (CEAs), were selected as the groups for study. The JDS was pilot tested on a small sample from each group to determine its appropriateness of content and format. Results of the pilot test and recommendations of pilot test participants were evaluated to aid in the development of a cover letter and in the revision of the JDS. The JDS was adapted for use in the study by replacing inappropriate background and personal items with items more suitable for use with the groups, and by adding a code number for follow-up purposes.

The data collection phase consisted of four steps over an eight week period: (a) an initial mail-out, (b) a follow-up letter, (c) a second mail-out and (d) contact by telephone. The mail-outs consisted of the JDS, a cover letter, and a self-addressed, stamped envelope. The follow-up letter and telephone contact simply asked non-respondents to participate.

Usable instruments were keyed, and the data were analyzed. The t-test was used to determine differences between the perceptions of CEAs and VATs concerning the job variables. The relationships between job characteristics and critical psychological states, and between critical psychological states and internal motivation were determined using Pearson Product Moment correlation coefficients.

Using a method described by Oliver and Hinkle (1981), a random sample of 300 subjects was selected from the populations of VATS and CEAs in Texas (150 per group). Of the 300 subjects, 265 or 88 percent returned the instrument. The number of usable responses by CEAs was 141 (94 percent); 121 VATs provided usable responses (81 percent).

RESULTS

Data in Table 1 identify and compare the perceptions of CEAs and VATs toward job variables related to internal motivation. The JDS norms for professional/technical jobs (Oldham, Hackman & Stepina, 1979, p. 28) are shown in the table. These norms were included for comparison because the reseacher considered CEAs and VATs to be a subset of the population of professional/technical employees. All characteristics, except motivation potential score" (MPS) were calculated on a scale of one to seven, with one meaning "very little" and seven meaning "very much" of the characteristic is present in the job. MPS reflects the overall motivating potential of a job in terms of the core job characteristics, and was calculated using the following formula:

$$\text{MPS} = \frac{\underset{\text{Variety}}{\overset{\text{Skill}}{}} + \underset{\text{Identity}}{\overset{\text{Task}}{}} + \underset{\text{Significance}}{\overset{\text{Task}}{}}}{3} \times \text{Autonomy} \times \begin{matrix}\text{Feedback}\\ \text{from}\\ \text{Job}\end{matrix}$$

CEAs perceived their jobs as being significantly higher ($p < .05$) than VATs in five job variables: skill variety, feedback from agents, dealing with others, satisfaction with compensation and satisfaction with job security. Skill variety involves the diversity of activities in a job. Feedback from agents concerns the amount of information employees receive from other people about job performance. Dealing with others measures the extent to which a job requires an employee to work closely with other people. Satisfaction with compensation includes pay and benefits, while satisfaction with job security reflects how secure employees feel in their jobs.

VATs perceived their jobs as being significantly higher ($p < .05$) in task identity than CEAs. VATs felt that the process of teaching vocational agriculture had a more definite beginning and end, and resulted in a more identifiable outcome.

Table 2 shows the correlations among job variables across CEAs and VATs. The relationships between the core job characteristics and the critical psychological states are all highly significant ($p < .01$) and range from .17 to .53. Similarly the relationships between the critical psychological states and internal motivation are highly significant ($p > .01$) and range from .26 to .44.

CONCLUSIONS

Public Sector administrators often have little control over resources needed to improve extrinsic motivation. To minimize personnel problems, administrators require information on which to base strategies designed to enhance internal motivation. The data suggest that potential does exist to enhance internal motivation in CEAs (MPS = 162) and VATs (MPS = 175) compared to the MPS "norm" of 154.

Table 1: Job Variable Means and Standard Deviations for Cooperative Extension Agents in Agriculture (CEAs), Teachers of Vocational Agriculture (VATs) and Professional Technical Jobs.

Job Variables	CEAs		VATs		Professional Technical Jobs[1]	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
Core Job Characteristics						
a Skill Variety	6.08	0.60	5.86	0.68	5.36	1.00
b Task Identity	4.85	1.08	5.29	1.12	5.06	1.16
Task Significance	5.93	0.83	5.95	0.89	5.62	0.95
Autonomy	5.64	0.97	5.76	0.82	5.35	1.05
Feedback from Job	4.98	0.99	5.19	0.94	5.08	1.11
Other Job Characteristics						
a Feedback from Agents	4.73	1.28	4.39	1.38	4.21	1.37
a Dealing with Others	6.54	0.53	5.88	0.85	5.83	0.96
Critical Psychological States						
Experienced Meaningfulness	5.73	0.72	5.88	0.74	5.40	0.87
Experienced Responsibility	5.75	0.56	5.86	0.86	5.75	0.72
Knowledge of Results	4.94	1.05	5.17	0.93.	5.00	0.99
Personal Outcomes						
General Satisfaction	5.07	0.93	5.01	0.98	4.88	0.99
Internal Motivation	5.91	0.46	5.84	0.50	5.77	0.65
Growth Satisfaction	5.74	0.73	5.72	0.65	5.06	1.09
Context Satisfactions						
a Satisfaction w/Compensation	4.32	1.43	3.61	1.68	4.40	1.51
a Satisfaction w/Job Security	5.50	1.07	5.16	1.37	4.96	1.16
Satisfaction w/Co-Workers	6.02	0.56	5.90	0.69	5.48	0.85
Satisfaction w/Supervision	5.23	1.35	4.96	1.46	4.89	1.29
Growth Need Strength	5.07	0.59	4.95	0.67	5.59	0.57
Motivation Potential Score	161.90	57.56	174.77	58.43	153.66	55.21

[1] Oldham, G. R., Hackman, R. J. & Steptina, L. P. Norms for the job diagnostic survey. JSAS Catalog of Selected Documents in Psychology, 1979, 9(1), 14.

a,b Represent significant differences ($p < .05$) in means: a = CEAs' mean higher; b = VATs' mean higher.

Table 2: Correlations Among Job Variables Across Two Professional Jobs in Agriculture: Cooperative Extension Agents in Agriculture and Teachers of Vocational Agriculture.

	Job Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Core Job Characteristics																			
1	Skill Variety	--																		
2	Task Identity	.09	--																	
3	Task Significance	.46**	.21**	--																
4	Autonomy	.26**	.35**	.33**	--															
5	Feedback from Job	.22**	.37**	.40**	.33**	--														
	Other Job Characteristics																			
6	Feedback from Agents	.09	.31**	.28**	.42**	.38**	--													
7	Dealing with Others	.31**	-.04	.25**	.09	.10	.16*	--												
	Critical Psychological States																			
8	Experienced Meaningfulness	.34**	.32**	.44**	.37**	.41**	.31**	.11	--											
9	Experienced Responsibility	.21**	.25**	.30**	.30**	.30**	.24**	-.09	.46**	--										
10	Knowledge of Results	.17**	.41**	.34**	.44**	.53**	.50**	-.06	.58**	.48**	--									
	Personal Outcomes																			
11	General Satisfaction	.22**	.25**	.34**	.50**	.40**	.42**	.09	.51**	.48**	.53**	--								
12	Internal Motivation	.39**	.16**	.39**	.28**	.23**	.15*	.18*	.37**	.44**	.26**	.25**	--							
13	Growth Satisfaction	.31**	.35**	.51**	60**	.41**	.46**	.11	.41**	.41**	.47**	.66**	.32**	--						
	Context Satisfactions																			
14	Satisfaction with Compensation	.02	.07	.05	.26**	.20**	.35**	.10	.11	.12	.23**	.36**	.08	.33**	--					
15	Satisfaction with Job Security	.14*	.14*	.19*	.42**	.09	.33**	.11	.18**	.25**	.30**	.45**	.09	.46**	.43**	--				
16	Satisfaction with Co-Workers	.22**	.25**	.44**	.39**	.26**	.30**	.28**	.39**	.32**	.32**	.50**	.27**	.62**	.14*	.35**	--			
17	Satisfaction with Supervision	.05	.23**	.22**	.47**	.19**	.63**	.14*	.26**	.26**	.44**	.50**	.14*	.53**	.50**	.53**	.37**	--		
18	Growth Need Strength	.21**	.01	.24**	.20**	.16*	.10	.15*	.12	.17**	.08	.06	.26**	.19**	-.02	.09	.13*	.04	--	
19	Motivation Potential Score	.40**	.56**	.57**	.72**	.82**	.48**	.14*	.50**	.39**	.61**	.53**	.37**	.63**	.24**	.30**	.43**	.38**	.25**	--

* p < .05
** p < .01
N = 253

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Although growth need strength (GNS) was lower for CEAs (GNS = 5.07) and VATs (GNS = 4.95) compared to the GNS norm of 5.59, this does not suggest that either group will not respond positively to administrative strategies designed to enhance internal motivation. Hackman and Oldham (1976) found that even though higher GNS individuals may react more enthusiastically than lower GNS individuals, the ultimate reaction to appropriate job modifications should be positive for all individuals.

Even though both groups tended to score higher than the norm on all of the JDS variables, specific weaknesses were evident. The CEAs' lower score for Task Identity may result from a large number of clients and a lack of an identifiable "product." VATs may deal with fewer people and therefore have more opportunity to observe any improvement in a client.

McCracken, Smith and Saundi (1982), suggested that if CEAs and VATs are to be most effective, administrators should reduce turnover. Craig (1981) found a turnover rate of 20 percent among Texas VATs. From the data, one possible explanation for the turnover of VATs in Texas is low satisfaction with compensation.

Finally, the correlations provide evidence that the job characteristics theory "works" with professional jobs in agriculture. Strong and positive relationships exist between the core job characteristics and the critical psychological states and between the critical psychological states and internal motivation.

RECOMMENDATIONS

Based on the above conclusions the following activities are suggested.

(1) Since the job characteristics theory "works" with professionals in agriculture, employers and others involved in professional development should focus on efforts to improve the factors that affect internal motivation.

(2) To determine means for enhancing internal motivation, those involved in the professional development of CEAs and VATs should concentrate on the job characteristics where weaknesses were found.

(3) To facilitate the dissemination of the results of this study, a summary of this study should be made available to those responsible for the professional development and supervision of CEAs and VATs in Texas.

(4) Since this study was limited to public sector professionals in agriculture, similar research should be conducted with agricultural professions in the private sector.

(5) Before the results of this study are implemented in any state other than Texas, this study should be replicated in that state.

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VOCATIONAL AGRICULTURE TEACHER COMMITMENT:
A CORRELATIONAL ANALYSIS

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INTRODUCTION

The quality of education is believed to be related to the degree of commitment of the men and women who serve as teachers in school systems. Teachers exercise subtle controls over education--what it is and what it can become--through their training, experience and behavior.

No one (Campbell, Cunningham, Nystrand & Usdan, 1980) would deny the power of a good and committed teacher in molding the minds of students (p. 276). The success of a nation depends upon its youth who have studied under teachers. Teachers who are committed to teaching as a profession are thought to be more effective than those who are not.

PURPOSE & OBJECTIVES

The primary purpose of the study was to investigate the major factors: demographic characteristics, job characteristics

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and work experiences, related to commitment to teaching as a profession among Ohio teachers of vocational agriculture.

The objectives of the study included:

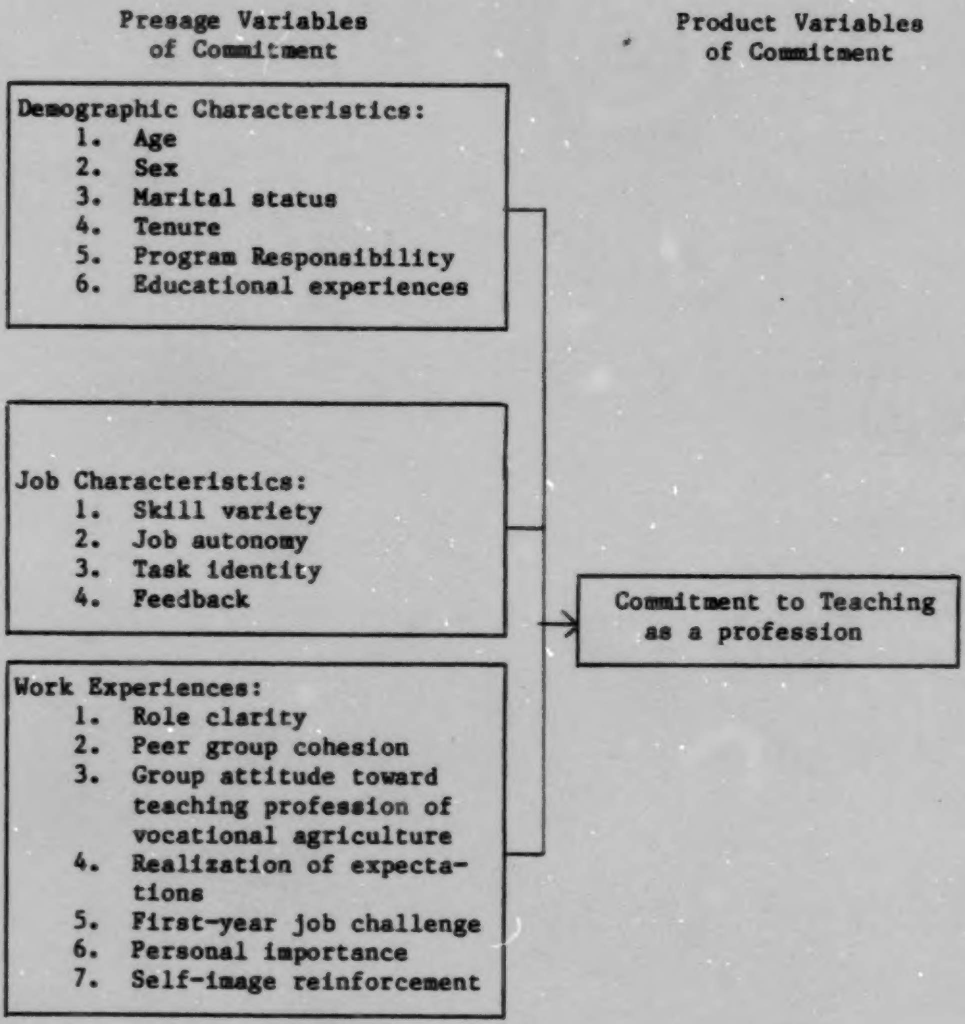
1. To determine the level of commitment to teaching as a profession by Ohio teachers of vocational agriculture.

2. To determine the relationship between commitment to teaching as a profession and selected demographic variables: age, sex, marital status, tenure, program responsibility and educational experiences.

3. To determine the relationship between commitment to teaching as a profession and job characteristic variables: skill variety, job autonomy, shared responsibility, credit for work and feedback.

4. To determine the relationship between commitment to teaching as a profession and work experiences: role clarity, vocational agriculture teachers' cohesion, group attitude toward teaching profession of vocational agriculture, profession work, realization of expectations, first-year job challenge, personal importance, individual actions and self image.

The variables in the study were derived from a model adapted from the works of Steers (1977) and of Suandi, McCracken & Smith (1982). Illustrated in Figure 1 are the independent (presage) variables and the dependent (product) variables for the study. Suandi, McCracken & Smith, (1982) in a study of agents in the Ohio Cooperative Extension Service, verified age, sex, tenure, skill variety, job autonomy, feedback, and all the work experience variables as potential predictors of organizational commitment.


Presage Variables of Commitment
Product Variables of Commitment
Demographic Characteristics:
1. Age
2. Sex
3. Marital status
4. Tenure
5. Program Responsibility
6. Educational experiences
Job Characteristics:
1. Skill variety
2. Job autonomy
3. Task identity
4. Feedback
Work Experiences:
1. Role clarity
2. Peer group cohesion
3. Group attitude toward teaching profession of vocational agriculture
4. Realization of expectations
5. First-year job challenge
6. Personal importance
7. Self-image reinforcement
Commitment to Teaching as a profession

Note: Adapted from "Antecedents and Outcomes of Organizational Commitment" by R. M. Steers, Administrative Science Quarterly, 1977, 22, 47.

Figure 1. The Circumstances of Commitment to Teaching as a Profession

METHODOLOGY

The population of the study was the Ohio secondary school teachers of vocational agriculture who were listed in the 1983-84 directory (N = 637). To get a more representative sample from the population, every fifth name (with a random start) was chosen from the directory (n = 128).

Data were collected through mail questionnaires. The instrument was field tested before it was used in the investigation. Reliability values (Cronbach's alpha), for the various sub-scales ranged from .36 (Job Autonomy) to .93 (Professional Commitment) in the initial survey. Another reliability analysis was performed on the variables after a survey of the actual sample of the subjects. Reliability values for the various sub-scales ranged from .45 (Self Image Reinforcement) to .87 (Realization of Expectations). Because of the low reliability coefficient of the independent variable: task identity (.53), the items making up the variable were broken into individual items and renamed: (a) shared responsibility; and (b) credit for work. They were individually analyzed. Similarly, the independent variable: self image reinforcement, with a reliability coefficient of .45, was broken into individual items and renamed: (a) individual actions; and (b) self image. They were also individually analyzed.

The questionnaire was mailed on October 17, 1983. A follow-up letter as well as another questionnaire (should the first one have been misplaced) was sent to nonrespondents on November 14, 1983. By December 9, 1983, a total of 104 (81%) of the subjects had returned usable questionnaires. Eight teachers were randomly drawn from the 24 non-respondents and interviewed by telephone. The non-respondent sample was asked for information on demographic characteristics and the commitment to teaching as a profession variables. Information on other variables: job characteristics and work experiences which were not asked for due to high cost was treated as missing data. The variance on among early respondents, late respondents and non-respondents on commitment to teaching, is shown in Table 1. The non-respondent sample was less committed to teaching than the respondent sample. For comparison purposes, the researcher cross-tabulated the percentage of respondents and non-respondents with the demographic variables. The non-respondent group, when compared to the respondent group, appeared more likely to be female, single, of less tenure and younger. These differences were not statistically significant ($p<.05$). There were also no differences between respondents and non-respondents in their areas of program responsibility.

Table 1

Analysis of Variance on Organizational Commitment Scores by Respondent Group

Source	Degree of Freedom	Sum of Squares	Mean Squares	F Ratio	F Prob
Between groups	2	4876.3113	2438.1555	14.916	0.000
Within groups	109	17817.2322	163.4608		
Total	111	22693.5430			

Note: Non-respondents' mean = 54.0 (n = 8)
Late respondents' mean = 81.2 (n = 16)
Early respondents' mean = 70.1 (n = 88)

There was a statistically significant difference between the two groups on their preparation toward entering the teaching profession of vocational agriculture. Respondents were more likely to have been traditionally prepared or non-traditionally prepared but possessing a bachelor's degree. Non-respondents were less likely to possess a bachelor's degree. The total response rate was 88%. Descriptive statistics were used to summarize the data. Pearson product moment correlation coefficients (r) were used to express direction and strength of relationships. The semi-partial multiple regression correlation coefficient technique was employed to determine the proportionate contribution of each individual independent variable to commitment to teaching. A stepwise multiple regression analysis was finally completed to find out the best predictors of commitment to teaching as a profession.

Findings

A 7-point Likert scale was used for the dependent variable measure. The mean score on the 7-point scale for respondents was 5.17. However, the mean score for non-respondents was 3.60. Therefore, the adjusted mean value for the sample was 4.98. A score of seven represented the greatest commitment and a score of one the least commitment.

The proportion of variance in commitment to teaching explained by the full model containing all significantly related independent variables was .62 (R^2). This is reported in Table 2.

Table 2

Semi-Partial Multiple Regression Coefficients for Sets of Independent Variables Found to be Significantly Correlated with Commitment to Teaching

Variable Set	k_A	k_B	sR^{2a}	F
Demographic characteristic variables	9	4	.0248	1.46
Job characteristic variable (feedback)	12	1	.0006	0.14
Work experiences	5	8	.4344	12.78^b

$^aR^2 = .6175$ $^bp<.05$ (df = 4,90).

Demographic Characteristics

A significant unique proportion of variance in commitment to teaching as a profession by Ohio teachers of vocational agriculture was not explained by the cumulative set of demographic characteristics ($sR^2 = .0248$, $F = 1.46$, $p<.05$). None of the demographic characteristic variables demonstrated either a substantial or a very strong relationship with the dependent variable: commitment to teaching as a profession. However, the following demonstrated low relationships with the dependent variable (Table 3).

1. Age (r = .20).
2. Being married (r = .16).
3. Teaching mechanics (r = -.21).
4. Teaching farm management (r = .18).

Job Characteristic Variables

There was a moderate positive relationship between commitment to teaching as a profession and feedback (r = .30, p<.001) (Table 4). Credit for work, skill variety, job autonomy and shared responsibility were not related to the dependent variable. Job characteristic variables as a set failed to explain a significant unique portion of the variance in the dependent variable.

Work Experience Variables

Most of the work experience variables did have a significant relationship with commitment to teaching as a profession (Table 5).

Table 3

Correlations of Demographic Characteristic Variables and Commitment to Teaching

	Age	Being Female	Being Married	Tenure	Production	Mech.	Ag. Bus.	Hort.	Animal Care	Resources	Processing	Management	Traditional	Non Ag Ed Degree	Non Degree	Comt.
Age	1.000															
Being female	-0.275^{a}	1.000														
Being married	0.317^{b}	-0.216	1.000													
Tenure	0.493^{b}	-0.326^{b}	0.232^{a}	1.000												
Production	-0.062	-0.137	0.102	0.266^{a}	1.000											
Mechanics	0.156	-0.134	0.000	-0.008	-0.513^{b}	1.000										
Ag. Business	0.070	0.120	0.057	-0.005	-0.218^{a}	-0.087	1.000									
Horticulture	-0.024	0.110	-0.347^{b}	0.013	-0.393^{b}	-0.157^{c}	-0.067	1.000								
Animal Care	-0.008	0.350^{b}	-0.121	-0.200^{c}	-0.180^{c}	-0.075	-0.032	-0.068	1.000							
Resources	-0.073	-0.070	0.082	-0.244^{a}	-0.270^{a}	-0.108	-0.046	-0.082	-0.040	1.000						
Processing	0.068	[illegible]	0.047	-0.043	-0.153	-0.061	-0.026	-0.047	-0.022	-0.032	1.000					
Management	-0.094	0.154	0.058	-0.131	0.186^{c}	-0.075	-0.032	-0.058	-0.028	-0.040	-0.022	1.000				
Traditional	-0.301^{b}	0.088	0.036	0.140	0.636^{b}	-0.496^{b}	0.046	-0.216^{c}	-0.104	-0.108	-0.177^{c}	0.011	1.000			
Non Ag Ed Degree	0.322^{b}	-0.102	-0.067	0.136	-0.160	-0.003	0.080	0.253^{a}	0.121	-0.082	-0.047	-0.066	-0.456^{b}	1.000		
Non Degree	0.104	-0.025	0.007	-0.259^{a}	-0.586^{b}	0.547^{b}	-0.114	0.065	0.128	0.222^{a}	0.220^{a}	0.025	-0.770^{b}	-0.206^{c}	1.000	
Commitment	0.197^{c}	-0.092	0.164^{c}	0.029	0.070	-0.206^{c}	-0.016	-0.060	0.043	0.065	0.020	0.179^{c}	0.020	0.122	-0.108	1.000

Note. n = 112.

$^{a}p<.01$. $^{b}p<.001$. $^{c}p<.05$.

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Table 4

Correlations of Job Characteristic Variables and Commitment to Teaching

	Skill Variety	Job Autonomy	Shared Responsibility	Credit for Work	Feedback	Commitment
Skill Variety	1.000					
Job autonomy	0.152	1.000				
Shared responsibility	0.097	0.038	1.000			
Credit for work	0.048	-0.009	0.357[a]	1.000		
Feedback	0.014	0.162[b]	-0.148	0.023	1.000	
Commitment	0.090	0.046	0.058	0.135	0.300[a]	1.000

Note. n = 104.

[a] $p<.001$. [b] $p<.05$.

Table 5

Correlations of Work Experience Variables and Commitment to Teaching

	Role Clarity	Cohesion	Group Att.	Prof. Work	Expec.	Job Chal.	Pers. Imp.	Ind. Actions	Self Image	Comt.
Role Clarity	1.000									
Cohesion	0.157	1.000								
Group attitude	0.215[a]	0.649[b]	1.000							
Profession-work	0.109	0.450[b]	0.658[b]	1.000						
Expectations	0.379[b]	0.433[b]	0.338[b]	0.209[a]	1.000					
Job challenge	0.359[b]	0.444[b]	0.434[b]	0.219[a]	0.499[b]	1.000				
Personal importance	0.251[c]	0.369[b]	0.329[b]	0.214[a]	0.397[b]	0.469[b]	1.000			
Individual actions	0.016	0.230[c]	0.215[a]	0.186[a]	0.302[b]	0.245[c]	0.282[c]	1.000		
Self image	0.063	0.348[b]	0.268[c]	0.199[a]	0.366[b]	0.377[b]	0.300[b]	0.290[b]	1.000	
Commitment	0.100	0.521[b]	0.354[b]	0.248[c]	0.429[b]	0.586[b]	0.641[b]	0.284[c]	0.454[b]	1.000

Note. n = 104.

[a] p<.05. [b] p<.001, [c] p<.01.

1. Vocational agriculture teacher cohesion ($r = .52$).
2. Group attitudes toward teaching profession of vocational agriculture ($r = .35$).
3. Realization of expectations ($r = .43$).
4. First-job challenge ($r = .59$).
5. Personal importance ($r = .64$).
6. Self image ($r = .45$).

The independent variables: profession work and individual actions, demonstrated low relationships ($r = .25$ and $r = .28$ respectively) with the dependent variable, commitment to teaching as a profession.

Also, the collective set of work experience variables explained a significant unique proportion of variance in the dependent variable ($sR^2 = .4344$, $F = 12.78$, $p<.05$).

Attitude Prediction

The following variables were determined by a stepwise regression analysis to be the best predictors (Table 6) of commitment to teaching as a profession by Ohio teachers of vocational agriculture:

1. Personal importance.
2. First-year job challenge.
3. Vocational agriculture teachers' cohesion.
4. Self image.

Table 6

Stepwise Multiple Regression of Commitment to Teaching Scores on the Significant Independent Variables

Independent Variables		R^2	R^2 Increment	F^a
Personal importance	(X_1)	.4109	.4109	5.30
First-year job challenge	(X_2)	.5153	.1044	5.05
Vocational agriculture teachers cohesion	(X_3)	.5598	.0445	2.73
Self image	(X_4)	.5668	.0070	2.38

$^a p < .05$.

The multiple regression equation with the respective calculated raw score partial regression weights (B's) and the intercept value (A) is:

$$Y = 1.12X_1 + .92X_2 + .54X_3 + 1.14X_4 + 18.03$$

This equation represents those significant variables which best predict commitment to teaching as a profession scores. The total multiple regression coefficient, $R^2 = .57$, represented the proportion of variance explained in the dependent variable by the equation.

Discussion of Findings

Based upon the findings of this study, there appear to be certain significant factors contributing to being committed to teaching as a profession by Ohio teachers of vocational agriculture. Those factors are:

1. Personal importance (the extent to which Ohio vocational agriculture teachers feel that they are making significant and appreciated contributions to the profession). There does appear to be an overall increase in commitment to teaching as a profession scores as teachers realize that the work they do makes important contributions to the overall aims of the profession. Regular evaluations of vocational agriculture teachers' work are very necessary in order to find out how they are fulfilling the overall objectives of the profession. Merit-rewards in the form of recognition and salary increase should be meted out to deserving teachers.

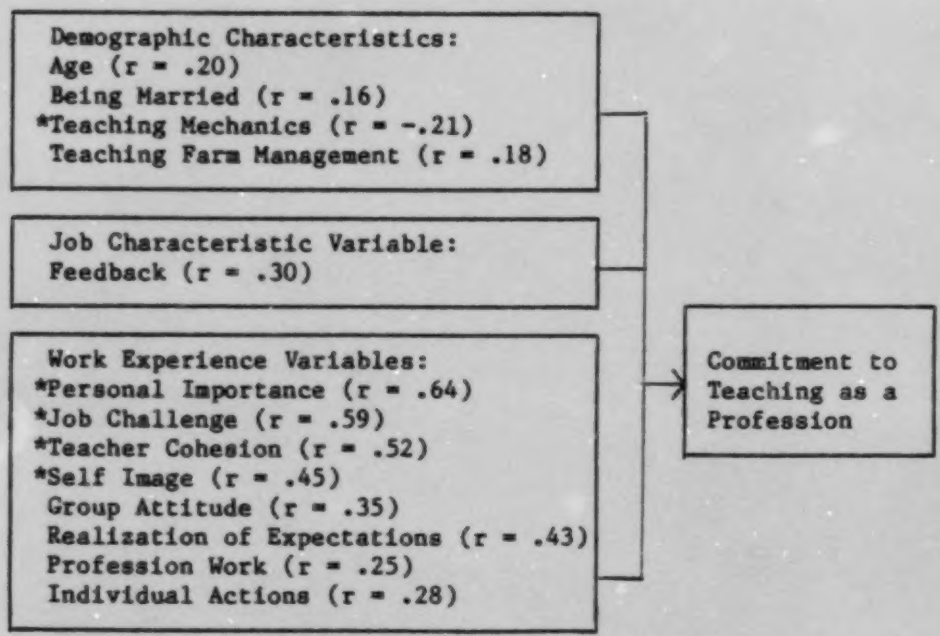
2. First-year job challenge: vocational agriculture teachers tend to be committed to teaching as a profession when they perceive that their jobs are interesting and challenging. The school authorities should acquaint the teachers at their initial entry to the profession with the overall objectives of the profession and what the profession expects of its teachers. The orientation program is therefore very necessary. The profession is challenging and interesting, but teachers should be helped to internalize this.

3. Vocational agriculture teachers' cohesion. A tendency to stick together appears to effect a spirit of being committed to teaching as a profession by vocational agriculture teachers in Ohio.

4. Self image reinforcement. The extent to which Ohio teachers of vocational agriculture are encouraged to behave in ways that represent their true feelings or attitudes appears to influence the degree of commitment to teaching as a profession.

Model

Based upon the findings and conclusions of this study, a model captioned "A Model of Commitment to Teaching as a Profession" (Figure 2), was restructured. The variables or factors included in the model were those which were significantly related to the dependent variable: commitment to teaching as a profession.


Demographic Characteristics:
Age (r = .20)
Being Married (r = .16)
*Teaching Mechanics (r = -.21)
Teaching Farm Management (r = .18)
Job Characteristic Variable:
Feedback (r = .30)
Work Experience Variables:
*Personal Importance (r = .64)
*Job Challenge (r = .59)
*Teacher Cohesion (r = .52)
*Self Image (r = .45)
Group Attitude (r = .35)
Realization of Expectations (r = .43)
Profession Work (r = .25)
Individual Actions (r = .28)
Commitment to Teaching as a Profession

*Significant semi-partial correlations (p<.05) with the dependent variable.

Figure 2. A Model of Commitment to Teaching as a Profession

Recommendations

Based upon the findings of this study, the following recommendations for further study have been generated:

1. Studies need to be conducted in search of additional demographic variables that might contribute toward being a committed teacher.

2. Studies should establish or set standards upon which evaluations of the work of Ohio teachers of vocational agriculture are based.

3. More studies on commitment to vocational agriculture teaching as a profession need to be conducted in other states than Ohio for comparison of findings.

4. Also, studies need to be conducted to examine the role the school authorities play in effecting a spirit of commitment to teaching vocational agriculture among their teachers.

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A DISCUSSION OF RESEARCH REPORTS PRESENTED ON THE THEME
"CHARACTERISTICS OF AGRICULTURAL EDUCATORS"

Concurrent Session C, 8:30-10:00 a.m.
November 30, 1984

NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETING
American Vocational Association
New Orleans, Louisiana

by

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We have come a long way in agricultural education research since I first served as a discussant several years ago. Now the process is more formal, the reports more sophisticated, and the research more competitive. I believe we have made progress in terms of both the quantity and quality of research presented over the years. And I'm sure that the discussant has played an important role in that progress.

As I approach my role of discussant today, I find it no easier to do now than before. However, I welcomed the opportunity to serve as a discussant because the process helps improve the profession, gives immediate feedback to the researcher, and helps the discussant to grow professionally as a result of the process. Today, I will discuss the papers in the order in which they were presented.

The first paper entitled "The Academic Ability of Agricultural Education Graduates Compared With Other Agriculture, Education and University Graduates" by George Wardlow and Larry Miller, focused on an important topic of current concern. The research results are important to the profession and are essential if we are to answer the critics who question teacher competency.

The researchers are to be commended on the following points:

1. The paper was concise and well written and the problem was stated effectively.
2. The paper included a strong, relevant review of literature.
3. The rationale built upon the problem statement and the review of literature.
4. The purposes were stated explicitly.
5. The limitations of the study were stated clearly.

6. The data were presented concisely.
7. The tables were well presented and informative.
8. The objectives of the study were accomplished.
9. And, as stated earlier, the paper focused on an important topic of current concern.

Following are some comments and questions that the researcher may want to consider:

1. It would be well to proof read the paper before submitting it to a national meeting. Several typos were found and in certain places, essential words were omitted.

2. The authors could have expanded the conclusions section. Other than quite obvious results, the readers were left to draw their own conclusions.

3. The authors stated, "Further study should be done." But, little direction was provided regarding direction for further study. No "recommendations" section was included in the paper.

4. A discussion section which raises issues related to the findings or discusses the implications and application of the findings would have been helpful.

5. The conclusion that agricultural education graduates were found to be not significantly different than other agriculture, secondary education, or university graduates on several measures is correct. What may be more correct is to discuss further the differences noted.

6. Finally, some questions. What can teacher educators conclude regarding the study? Should we make sure agricultural education students are the same as other students on certain measures before they are accepted into our programs? at the end of the program? Are there measures in certain areas where our graduates score higher than the university mean? If so, what are they and how can we incorporate them into our admissions procedures? Do we or others in education inflate grades so that our graduates will compare favorably on outcome measures? Results of the study seem to indicate that grade inflation results in secondary education graduates.

In summary, the study provides important data which can be used to dispel myths regarding teacher competency. It provides a benchmark for theory building and makes an important contribution to the profession. More elaboration of the findings regarding conclusions, recommendations, applications, and implications would have been beneficial to the reader.

The second paper, entitled "Job Variables Related to Internal Motivation As Perceived By Persons Employed In Selected Professional Occupations In Agriculture" by John Carnes and Don Herring was again an important paper. It was well written and well documented.

More specifically, the researchers are to be commended for:

1. providing a thorough definition of the problem, including a relevant review of research and an excellent theoretical framework upon which to base the study.
2. stating the purposes appropriately.
3. using a valid and reliable instrument.
4. explaining what the instrument used measures in a thorough manner.
5. pilot testing the instrument used.
6. obtaining a high response rate.
7. stating the conclusions clearly and discussing the implications.
8. presenting recommendations for further study.

Following are some comments and questions the researchers may want to consider:

1. It may have helped the reader if the population of teachers and agents had been defined more thoroughly.
2. It would have been helpful if the pilot test procedures were explained more thoroughly.
3. To what extent was the JDS modified? The assumption is being made that the modifications made did not affect the validity and reliability of the instrument.
4. It would have been helpful if significant differences between the two groups had been presented more clearly in Table 1. Also, there is no way of determining whether or not the means of CEAs and VATs differ significantly from those in other professional jobs.
5. When was the survey conducted? Job pressures and responsibilities vary from one time of the year to another. What assurance do we have that the survey was administered at a time when the two groups were experiencing similar job pressures and responsibilities? Would the results have been different if the survey were conducted during a different time of the year?
6. It seems to me that further work needs to be done to identify the concrete activities necessary to carry out the first two recommendations. What are some specific things that employers can do to affect internal motivation? to enrich areas of weakness?
7. What should be the balance between extrinsic and intrinsic rewards? To what extent should employers of agricultural professionals promote either? Who can or should be their primary advocates? To what extent should agriculture professionals be their own advocates?

In summary, the paper was comprehensive, well written, and based on sound theory. Accepted procedures and instrumentation were used. Based on the results of the study, employers of agricultural professionals have insight regarding specific areas of intrinsic reqards to address to enrich the motivation of CEAs and VATs. Further identification of specific actions to be taken in each area of intrinsic motivation seems to be in order.

The third paper, "Vocational Agriculture Teacher Commitment: A Correlational Analysis" by David McCracken and Lugard Etuk also addresses a current concern. The researchers are to be commended for:

1. field testing the instrument used.
2. basing the study on a theoretical model.
3. surveying non respondents.
4. preparing a revised model of commitment to teaching as a profession based upon the findings of the study.

Following are some comments and questions the researchers may want to consider:

1. The format specified for papers to be presented at the NAERM was not followed.
2. A more comprehensive review of the research could have been included.
3. The paper did not flow well from section to section.
4. The rationale for conducting the study was not clearly delineated and did not emerge from a well stated theoretical base.
5. The procedure for determining sample size was not stated.
6. Very little information was presented regarding how the instrument used was developed.
7. There is a discrepancy regarding whether or not significant differences were found (see pages 9 and 16).
8. The researchers may have gone beyond the scope of the findings in presenting certain recommendations. For example, "Merit-rewards in the form of recognition and salary increase should be meted out to deserving teachers."
9. It was hard to determine whether the variables or factors included in the model were significant or not. Some places in the paper infer that they were significant, other places infer that they were not significant.
10. The model presented should not be perceived as a generic model for all teachers as implied in its title. It should be limited to the population studied.

In summary, the study addressed an issue important to the profession. However, the manner in which it was presented detracted considerably from its potential impact.

In conclusion, progress in agricultural education depends largely on the quality and the quantity of the research and development base that supports it. Today, we have heard research reports that contribute to that base. I commend the researchers for their inquiry efforts and I thank you for the opportunity to serve as a discussant for this National Agricultural Education Research Meeting.

THEME: EVALUATION OF VOCATIONAL AGRICULTURE

ASSESSMENT OF COMPETENCIES POSSESSED BY STUDENTS IN THE FUNDAMENTALS OF AGRIBUSINESS AND NATURAL RESOURCES OCCUPATIONS PROGRAM

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ASSESSMENT OF COMPETENCIES POSSESSED BY STUDENTS IN THE FUNDAMENTALS OF AGRIBUSINESS AND NATURAL RESOURCES OCCUPATIONS PROGRAM

INTRODUCTION

One commonly used measure of the effectiveness of a curriculum is the performance of students. The assessment of student mastery of skills and knowledge may also be a measure of teacher effectiveness. Thus, tests provide a measure of how much is being learned in an instructional program and how well the objectives are being mastered. In order to properly use student tests as a measure of program effectiveness, a set of measurable objectives must be developed.

One measure of program effectiveness is the extent to which students completing or leaving an instructional program possess or fail to possess the competencies specified in the instructional objectives. Therefore, test information can not only be used to evaluate program effectiveness, but can also be used to evaluate the students' mastery of instructional objectives as an aid to placing students in appropriate employment or in additional instructional situations (Glasser and Nitko, 1971).

PURPOSE AND OBJECTIVES

The central purpose of this study was to assess the level of mastery of the students enrolled in the Fundamentals of Agribusiness and Natural Resources Occupations program in Florida schools during the 1982-1983 school year. In order to achieve this purpose, the following objectives were developed as guidelines for conducting the research:

1. Determine the level of mastery of currently enrolled vocational agriculture students on the Fundamentals of Agribusiness Occupations Achievement Test (FAOAT).

2. Compare students' level of mastery on the Fundamentals of Agribusiness Occupations Achievement Test (FAOAT) according to the following:

   A. Current Grade in School
   B. Previous Enrollment in Agricultural Classes
   C. FFA Membership
   D. Involvement in Supervised Occupational Experience Program (SOEP).
   E. Career Plans

3. Determine whether or not competencies identified in the Curriculum Guide For Fundamentals of Agricultural Occupations (Department of Education, 1980) were being taught by teachers in the schools.

4. Determine the percentage of time, as indicated by teachers, devoted to each of the major content areas recommended for inclusion in the Fundamentals program.

PROCEDURES

Population

The population for the study was schools in which Fundamentals of Agribusiness and Natural Resources Occupations (DOE #3710) programs were offered during the 1982-1983 school year.

The five department of education regional consultants for agribusiness and natural resources education were contacted and asked to identify the Fundamentals programs and teachers in their region. This resulted in a list of 190 teachers who were offering the Fundamentals program. Each identified teacher was contacted to determine if they would be willing to administer the FAOAT to their students near the end of the school year. Fifty-seven teachers indicated they would be willing to participate and could administer the tests to approximately 2,250 students enrolled in the Fundamentals program.

Instrument Development

A sixty-item objective test was developed. The questions comprising the test covered competencies identified in the Curriculum Guide for Fundamentals of Agriculture Occupations (Department of Education, 1980) in each of the six major content areas contained in the Fundamentals program. These content areas include agribusiness management, animal science, plant science, soil science, agricultural mechanics, and leadership. The number of questions on the test related to these content areas was proportional to the recommended percentage of time that should be allocated to instruction in each content area.

Test questions were selected from those for each major content area in the item banks developed previously (McGhee and Cheek, 1983). The mean item difficulty and discrimination values for the test were .60 and .55, respectively. An estimate of the reliability of each component of the test was determined by calculating a Kuder-Richardson 20 correlation coefficient and was as follows: animal science, .94; agricultural mechanics, .95; leadership, .58; plant science, .86; agribusiness management, .65; and soil science, .79.

In addition to the sixty test items designed to assess performance in Fundamentals of Agribusiness and Natural Resource Occupations, five additional items sought information concerning the student's grade in school, FFA membership, previous enrollment in agricultural classes, supervised occupational experience program involvement, and career plans.

A teacher questionnaire was developed to determine the percentage of time spent on topics related to the six major Fundamentals content areas. Part II of the questionnaire asked the teacher to indicate whether or not each of the 76 competencies identified in the Curriculum Guide For Fundamentals of Agriculture Occupations (Department of Education, 1980) for the Fundamentals of Agriculture Occupations program was included in their Fundamentals program.

Data Collection and Analysis

Data for this study were collected from 2,011 (89.3 percent) students and 54 (94.7 percent) of the teachers who were originally contacted.

To analyze data related to objectives one and two, total mean scores were computed for the sixty-item Fundamentals of Agribusiness Occupational Achievement Test (FAOAT). Descriptive statistics were also utilized to summarize each of the five demographic variables in objective two. One-way analysis of variance was used for students' mean scores on the FAOAT when considering grade in school and career plans. Likewise, the t-test was also used in objective two to determine whether differences existed in students' mean scores on the FAOAT with respect to current grade in school, FFA membership, previous enrollment in agricultural classes and involvement in supervised occupational experience programs. Descriptive statistics were used to summarize and analyze the data in objectives three and four.

RESULTS

Objective One

Objective one was designed to determine the mastery level (achievement) of currently enrolled vocational agriculture students on the Fundamentals of Agribusiness Occupations Achievement Test (FAOAT).

The mean score of the 2,011 students administered the sixty-item FAOAT was 34.23 or 57.05 percent. The standard deviation was 9.79 which indicated that approximately two-thirds (68 percent) of the students' mean raw scores were between 24.4 and 44.0. The raw scores ranged from 3 to 60.

The Fundamentals of Agribusiness Occupations Achievement Test (FAOAT) was composed of questions in six major content areas: animal science, agricultural mechanics, leadership, plant science, agribusiness management, and soil science. Data in Table 1 revealed that the mean percentage score of students for questions in each content area ranged from a low of 50.6 percent for agricultural mechanics to a high score of 68.1 percent in agribusiness management. Animal science and plant science questions were second and third in ranking in terms of percentage of questions correctly answered with 59.4 percent and 62.3 percent, respectively. The fourth and fifth highest percentage achievment scores were in the areas of soil science (54.2 percent) and leadership (54.7 percent).

TABLE 1

Achievement of Students on FAOAT on Questions Related to Major Content Areas of the Fundamentals Program

n = 2011

Content Area	# of Test Questions	Mean Raw Score	SD	Percent Score
Agribusiness Management	7	4.77	1.94	68.1
Plant Science	9	5.61	2.09	62.3
Animal Science	11	6.53	2.25	59.4
Leadership	9	4.93	2.00	54.9
Soil Science	9	4.88	2.06	54.2
Agricultural Mechanics	15	7.60	2.61	50.6

Objective Two

Objective two sought to compare students' level of mastery on the FAOAT according to five variables: current grade in school; previous enrollment in agricultural classes; FFA membership; involvement in supervised occupational experience program; and, career plans.

Current Grade in School

The total mean raw scores and standard deviations for the various grade in school categories of students taking the FAOAT are presented in Table 2. The scores ranged from a high of 36.69 for students in the twelfth grade to a low of 25.95 for the eighth grade.

TABLE 2

Mean Raw Score on FAOAT According to Grade in School

n = 1935

Current Grade in School	Number	Percentage	Mean Raw Score*	Standard Deviation
8th	89	4.59	25.95A	8.56
9th	1338	69.15	35.06BC	9.02
10th	265	13.70	33.85B	8.34
11th	157	8.11	34.49BC	8.76
12th	86	4.45	36.69C	9.10

* Mean scores with the same letter are not signficantly different at the .05 alpha level.

A one-way analysis of variance was computed to determine if there were significant differences among the various grade levels of students in the mean scores of students on the FAOAT. The analysis of variance resulted in an F value of 20.91, which was significant at the .0001 level. Duncan's Multiple Range Test was used to compare the mean scores fo the five grade level categories.

The mean FAOAT scores of students enrolled in twelfth grade were significantly higher than students enrolled in either eighth or tenth grade. Likewise, students in the ninth, tenth, eleventh and twelfth grades scored significantly higher on the FAOAT than students in the eighth grade.

Previous Enrollment in Agriculture

In response to the question of whether they had ever been in an agriculture class before the current year, 47.5 percent of the students indicated that they had previously been in an agriculture class while 52.5 percent had not been enrolled. The t-test was used to determine whether significant differences existed between the two groups of students and their mean raw scores on the FAOAT with the .05 level of significance as the critical standard. This procedure revealed that there was no significant difference between students who had and students who had not previously been enrolled in an agricultural class. The mean raw score for previously enrolled students was 35.39 which was slightly more than the score of 34.72 for students who had not previously been in an agricultural class.

Membership in FFA

Students completing the FAOAT indicated that 57.7 percent of them were currently members of their school's FFA chapter, while 42.3 percent were not. To determine whether there were significant differences between students' performance on the FAOAT and their membership in FFA, the t-test with a .05 level of significance as the critical standard was used. Students who were currently FFA members scored significantly higher (36.89) on the FAOAT than students who were not FFA members (32.49).

SOEP Involvement

Almost two-thirds (61.9 percent) of those responding indicated that they did have a Supervised Occupational Experience Program (SOEP) while 38.1 percent did not. The t-test was used to determine if students with an SOEP performed significantly different on the FAOAT from students with an SOEP. A .05 level of signficance was used as the critical standard. Data indicated that students with an SOEP had mean scores signficantly higher (35.87) than students who indicated they did not have an SOEP (33.75).

Career Plans

Students were asked to indicate their career plans after high school graduation. Data in Table 3 reveal that the students who plan to attend college and students who were unsure of what their plans were comprised the largest proportion (30.40 and 30.35 percent, respectively) of the respondents. Only 14.03 percent of the students indicated plans to enter an agricultural occupation. The military was indicated by 15.41 percent of the students as being in their future career plans. The smallest proportion (9.81 percent) of the students indicated that they planned to work in a non-agricultural occupation.

TABLE 3

Career Plans After Graduation of Students
Completing the FAOAT

n = 1865

Career Plan	Number	Percent
Agricultural Occupation	266	14.03
Non-Agricultural Occupation	186	9.81
College/Post High School Education	576	30.40
Military	292	15.41
Do Not Know	575	30.35
TOTAL	1865	100.00

A one-way analysis of variance was computed to determine if there were significant differences among the various career plans of students and their mean scores on the FAOAT. The analysis of variance resulted in a F value of 20.06, which was significant at the .0001 level. Duncan's Multiple Range Test was used to contrast the mean scores for the five categories of career plans.

As indicated in Table 4, the mean raw FAOAT scores of students who planned to attend college were significantly higher than the scores of students in the other categories. Likewise, students with plans to enter an agricultural occupation, the military or who did not know their plans, scored significantly higher on the FAOAT than students planning to enter a non-agricultural occupation.

TABLE 4

Mean Score on FAOAT According to Career Plans

n = 1895

Career Plans	Number	Mean Raw Score*
Agricultural Occupation	266	34.49B
Non-Agricultural Occupation	186	30.08C
College/Post High School Education	576	36.82A
Military	292	34.49B
Do Not Know	575	33.66B

* Means with same letter are not significantly different at the .05 alpha level

Objective Three

This objective sought to determine whether or not competencies identified in the Curriculum Guide For Fundamentals of Agricultural Occupations (Department of Education, 1980) were being taught by teachers participating in this study. Seventy-six competencies were identified in the curriculum guide.

Data in Table 5 identify the degree to which the 76 competencies included in the Curriculum Guide For Fundamentals of Agriculture Occupations (Department of Education 1980) were being taught by the teacher respondents in this study. The data reveal that 34 (44.7 percent) of the competencies were taught by 75 - 100 percent of the teachers. Nineteen competencies (25 percent) were taught by 50 - 75 percent of the teachers. Twenty competencies (26.3 percent) were included in the programs of 25 - 50 percent of the teachers. Only three (4 percent) of the 76 competencies were taught by 0 - 25 percent of the teacher respondents.

TABLE 5

Degree to Which Fundamental Competencies Are Being Taught by Teachers

n = 54

Percent of Teachers	Number of Competencies	Percent
0 - 24.9	3	4.0
25 - 29.9	20	26.3
30 - 74.9	19	25.0
75 - 100.0	34	44.7
TOTAL	76	100.0

The 34 competencies identified by over 75 percent of the teachers as being included in their Fundamentals program came from each of the six major content areas. The largest number of competencies was in the area of plant science (10) and the smallest number was related to agricultural mechanics (2). The other content areas of animal science, soil science, leadership, and agribusiness management contained 7, 6, 5, and 4 competencies, respectively.

The number of competencies identified by over 75 percent of the teachers as being included in their programs were compared with the total number of competencies identified in the teacher questionnaire. Data in Table 6 reveals that 100 percent of the competencies in the area of leadership were identified by over 75 percent of the teachers as being included in their program. Soil science had the second highest proportion (66.7 percent) of competencies being taught by over 75 percent of the teachers. Slightly over one-half of the 18 plant science competencies (55.5 percent) and 57.1 percent of the 7 agribusiness management competencies were indicated by the teachers as being included in their program. Little more than one third of 19 animal science competencies (36.8 percent) and only 12.5 percent of the agricultural mechanics competencies were being taught by 75 percent or more of the 54 teachers responding to this study.

TABLE 6

Percentage of Competencies* By Content Area Identified By More Than 75 Percent of Teachers As Being Included in Fundamentals Program

n = 54

Content Area	Total # of Competencies	# of Competencies Identified by 75%	Percent
Animal Science	19	7	36.8
Agricultural Mechanics	16	2	12.5
Leadership	5	5	100.0
Plant Science	18	10	55.5
Agribusiness Management	7	4	57.1
Soil Science	9	6	66.7

* Identified in Curriculum Guide For Fundamentals of Agricultural Occupations, Department of Education, 1980.

Objective Four

Objective four sought to determine the percentage of time devoted to each of the major content areas recommended for the Fundamentals program. Teachers were asked to estimate the percentage amount of time spent teaching topics related to animal science, agricultural mechanics, leadership, plant science, agribusiness management and soil science. They also indicated a percentage of time spent in miscellaneous topics and activities.

As the data in Table 7 reveal, the content areas of plant science and animal science were quite similar in mean time spent by the 54 responding teachers with 21.8 percent and 21.4 percent, respectively. Teaching related to leadership topics consumed 15.5 percent of the time. Agricultural mechanics content consumed 12.8 percent of the school year and soil science and agribusiness management topics were taught 10.7 and 7.5 percent, respectively. Miscellaneous topics used 10.3 percent of the time.

The data also revealed differences between the percentage time recommended for the various content areas and the actual estimate of time as perceived by the teacher respondents. The greatest difference (12.2 percent) was between recommended time for the agricultural mechanics component (25 percent) and the teacher estimate of actual time spent (12.5 percent). All the rest of the differences were between 3.4 and 4.5 percent.

TABLE 7

Comparison of Recommended Percentage and Teacher Estimate Of Mean Percentage of School Year Devoted to Major Content Areas in Fundamentals Program

n = 54

Content Area	Recommended Percentage*	Teacher Estimate	SD	Percentage Difference
Animal Science	18	21.4	11.7	+ 3.4
Ag Mechanics	25	12.8	11.2	- 12.2
Leadership	12	15.5	9.3	+ 3.5
Plant Science	18	21.8	13.9	+ 3.8
Agribusiness Mgmt	12	7.5	5.3	- 4.5
Soil Science	15	10.7	6.8	- 4.3
Miscellaneous	0	10.3	9.0	+ 10.3
TOTAL	100	100.0		

* Source: Curriculum Guide For Fundamentals Of Agricultural Occupations, Panhandle Area Educational Cooperative, 1980.

CONCLUSIONS

Objective One

1. Students' level of mastery on the 60 item FAOAT was slightly over 57 percent.

2. Students performed best on FAOAT questions related to agribusiness management (68.1 percent) and plant science (62.3 percent and the poorest on agricultural mechanics questions (50.6 percent).

Objective Two

1. Over three-fourths of the students completing the FAOAT were in the ninth and tenth grades.

2. Students in twelfth grade scored significantly higher on the FAOAT than eighth and tenth graders. Also, students in grades nine, ten and eleven scored better than eighth graders.

3. Over half of the students (52.5 percent) taking the FAOAT had never been in an agriculture class before and did not score significantly differently from those that had been previously enrolled in agriculture.

4. Students taking the FAOAT who were currently members of FFA scored significantly better on the test than students who were not in FFA.

5. The 61.9 percent of the students taking the FAOAT who indicated some involvement in supervised occupational experiences scored significantly better on the FAOAT than those who had no involvement.

6. College and post high school education-bound students scored significantly better on the FAOAT than students indicating other career plans.

7. Students with plans to enter agricultural occupations, the military or who had no plans, scored higher on the FAOAT than students who planned to enter a non-agricultural career field.

Objective Three

1. Almost seventy percent (69.7 percent) of the 76 listed Fundamental competencies were taught by 50 percent or more of the teacher respondents.

2. All of the competencies in the leadership content area were taught by 75 percent or more of the teachers.

3. Only two of the sixteen (12.5 percent) competencies in the agricultural mechanics content area were taught by 75 percent or more of the teachers.

Objective Four

1. Animal science and plant science topics consumed the largest percentages of the school year as perceived by the teachers. Topics related to agribusiness management used the smallest percentage.

2. A much smaller percentage of time was actually spent in agricultural mechanics instruction than was recommended by state curriculum guidelines.

RECOMMENDATIONS

Based upon the data collected, analyzed and reported herein, the investigators make the following recommendations:

1. In light of the fact that such a small percentage of competencies related to agricultural mechanics are being taught by a majority of the teachers and considering that students performed the poorest on FAOAT questions in this content area, emphasis should be given to strengthening the development of fundamental competencies in agricultural mechanics. Strategies for strengthening this component might include but not be limited to:

(1) inservice educational activities to develop the agricultural mechanics skills of teachers; (2) special attention by Department of Education regional consultants for agribusiness during the program review process to note deficiencies related to agricultural mechanics instruction; and (3) increased attention at the pre-service level to emphasize the role and need for instruction in agricultural mechanics at the Fundamentals "level" in the program of vocational agriculture.

2. Teachers of agriculture who teach Fundamentals of Agribusiness and Natural Resources should encourage all students to be members of the FFA chapter and to become involved with appropriate supervised occupational experiences. This reccommendation is made because of the significantly better performance of students on the FAOAT who were members and indicated some involvement with supervised occupational experiences.

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ANALYSIS OF THE OCCUPATIONAL ATTAINMENT OF AGRICULTURAL EDUCATION GRADUATES OF THE HIGH SCHOOL CLASS OF 1972

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ANALYSIS OF THE OCCUPATIONAL ATTAINMENT OF AGRICULTURAL EDUCATION GRADUATES OF THE HIGH SCHOOL CLASS OF 1972

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At a time when the critics of public education in America are increasingly vocal, it is more important than ever that agricultural education be prepared to examine itself with a view toward program improvement. One frequently used criterion for such evaluation is earnings of graduates, (Hillison, 1979 and Kotrlik, 1979). On the other hand, Warmbrod (1975) makes the argument that no single program should be expected to be the sole determining factor in a graduate's later success. Rather, he contends that numerous background variables as well as other school and life experiences have greater total effects on such outcomes. In that regard, Welo and Copa (1981), Rohner (1983), and Richardson (1975) all found that background variables such as parent's income, socioeconomic status of family, educational levels of parents, and ability level all affect the later socioeconomic attainment of the graduate. Copa and Forsberg, (1981) found that sex and race also affected socioeconomic attainment of the graduate.

Objectives of the Study

The specific objectives of this study were to determine the following:

1. When their varying backgrounds are taken into account, are there differences in the job status attainment among

agricultural education, semi-agricultural education, and non-agricultural education high school graduates who were employed in agricultural occupations for each year from 1972 through 1979?

2. Again, when their backgrounds are accounted for, are there differences in the job status attainment among agricultural education, semi-agricultural education, and non-agricultural education high school graduates who were employed in non-agricultural occupations for each year from 1972 through 1979?

Data Collection

Collection of large scale sets of data is always expensive, particularly if the data are longitudinal in nature. To address that problem on behalf of the research community, the National Center for Educational Statistics (NCES) in the United States Department of Education maintains an ongoing effort toward the collection of such data. The National Longitudinal Study of the High School Class of 1972 (NLS72) was one result of that effort and provided the data for this study. NLS72 was a longitudinal study of a national probability sample of 23,451 high school seniors in the class of 1972 from throughout the United States. It includes over 1900 variables in a total of six surveys covering an eight year period. As in all longitudinal studies, there was some mortality in the sample; however, as a result of rather elaborate followup procedures, at the end of the fourth survey in 1979, a total of 78% of the base year respondents were still in the sample, (National Center for Educational Statistics, 1981, vol 1). Data were used for this study from a total of 6585 graduates. This consisted of all of those respondents on whom data regarding the number of semesters of agricultural education completed were reported by school officials in the first round of surveys.

The variable of specific interest to this study was an indirectly-derived score known as Socioeconomic Index (SEI), or Duncan Scale score. The Duncan Scale is widely accepted in sociological literature as a measure of socioeconomic attainment. It is a continuous variable ranging from 3.0 to 99.0 with the higher numbers indicating greater prestige and income. On the Duncan Scale, college professors have a score of 84.0 while retail clerks have a Duncan score of 29.0, (Gordon,1984). The actual regression equation by which the Duncan Scale was constructed is $SEI= .59 * \text{Education Level} + .55\% * \text{Income} - 6$, (Gordon,1984).

The actual occupations in which the graduates were employed in each year of the study were also reported. By examination of the reported occupations of respondents, it was possible to classify workers into either agricultural or non-agricultural occupations for each year.

Findings

Agricultural Occupations. Analyses for each year from 1972 through 1979 were completed, except for 1977 when no SEI scores were computed. Significant differences ($p<.05$) were found in 1973, 1976, and 1979. In all three years, SEI scores of non-agricultural education graduates were significantly higher than for agricultural education graduates. If no further analyses had been done, the conclusion would be that participation in agricultural education served to the socioeconomic disadvantage of graduates for three out of seven reported years. Moreover, the greater the level of participation, the more extreme the disadvantage appeared to be.

When multiple regression analyses were run for each of the years in which significant F's were found in the ANOVA's, only in the regression analysis for 1976 did semesters of agricultural education enter the equation at $p<.05$. For that year, the beta weight for semesters of agriculture in the regression formula was $B = -.17$ and the coefficient was $b = -3.51$.

The third procedure involved the use of the Veldman formula to measure the portion of the SEI variance that was associated with the semesters of agriculture taken (Veldman, 1967). This procedure produced a Delta-R^2 of .0214 for the one year that semesters of agricultrual education significantly entered the equation. This means that only 2.14% (.0214) of the variance of the SEI variable could be attributed to participation in agricultural education and that for only one year out of the seven for which data were available.

Non-agricultural Occupations. When the respondent pool was sorted for those in non-agricultural occupations, ANOVA procedures resulted in significant F's for each year from 1972 through 1979, again excluding 1977 for which no SEI scores were reported. Thus, the initial conclusion, based on one-way analysis of variance, would be that for each year in which followups were made, socioeconomic attainment was greater for both non-agricultural and semi-agricultural education graduates than for agricultural education graduates.

Application of multiple regression techniques to control for the effects of the background variables identified earlier produced somewhat different results. Only in the regressions for 1973, 1974, and 1979, did semesters of agriculture produce significant beta weights for the equation. In all three cases, the regression coefficients were negative on the number of semesters taken.

Use of the Veldman technique in those three instances produced Delta-R^2's of .0020, .0010, and .0014, respectively. This can be interpreted to mean that for those three years, the percentages of the variances of the SEI criterion variable associated with semesters of agriculture completed were .1%, .2%, and .14%, respectively. Again, such small proportions of the variance, although statistically significant, provide virtually nothing of practical significance in terms of prediction or explanation.

Conclusions

1. On initial analysis, participation in agricultural education appeared to affect adversely the socioeconomic attainment of graduates entering not only non-agricultural occupations but agricultural occupations as well. The results of the analysis changed dramatically when the effects of the background variables were taken into account. This finding supports earlier studies which have indicated that program evaluations cannot be based simply on graduate income levels or placement records. Such global outcomes are almost certainly

affected by the graduate's socioeconomic background, family history, type of community, sex, race, and numerous other background variables. Therefore, we conclude that agricultural education program evaluations are too complex to be addressed adequately by such simplistic analyses as straightforward examination of graduate incomes or placement records which fail to take into account the numerous other background variables that help to shape the lives of the student/graduate.

2. This study did not find evidence that agricultural education training provided its graduates with any advantage in the occupational marketplace, even when the graduates were in agricultural jobs. In fact, when differences in socioeconomic attainment were found, they were in favor of the non-agricultural education graduate. On the other hand those differences, albiet statistically signigicant, were so small as to be of no practical significance. Thus we conclude that participation in agricultural education training in high school had no practical effect, either positive or negative, on the subsequent job status attainment of graduates who entered either agricultural or non-agricultural occupations.

3. When one examines the proportion of the explained R^2 that can be attributed to the semesters of agricultural education completed, it becomes clear that practically none of the variance of the former is associated with the latter. Thus, the differences between the occupational outcomes of non-agricultural and agricultural education graduates can be attributed almost totally to socioeconomic history and other background variables rather than participation in agricultural

education courses in high school.

Importance of the Study

If agricultural education is to continue to be a viable educational program in this country, the profession must continually evaluate itself in terms of some set of reasonable criteria. One logical criterion would appear to be the occupational outcomes of graduates, measured in terms of socioeconomic attainment. Historically, studies of this nature have measured merely income or employment, have not considered the impact of background variables, or have been localized to a single state or region of the country. This study addressed the degree to which occupational attainment was associated with participation in agricultural education for graduates of the high school class of 1972 over the period 1972-1979, after taking into account the affects of selected background variables. It therefore provides a national longitudinal evaluation of the occupational outcomes of agricultural education graduates as compared to other high school graduates.

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RELATIONSHIP OF OCCUPATIONAL STATUS AND ATTITUDES ABOUT VOCATIONAL AGRICULTURE

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INTRODUCTION

Accountability has been an important concern in vocational education for several years. The Vocational Amendments of 1976 specifically emphasize program accountability and the need for evaluative data concerning the effectiveness of programs in delivering educational services. More recently, some states have passed specific legislation requiring programs to be accountable for expenditures. For example, Florida has recently enacted legislation that sets minimum placement and completion standards for all vocational programs (Florida Statute 229.551).

An important source of evaluative data for vocational education programs is the graduates of those programs. In addition to knowing placement and completion rates, it is important to have an understanding of student attitudes about the educational experiences they received while enrolled in vocational agriculture.

In the first phase of this study (Arrington and Price, 1983), the attitudes of high school seniors about experiences received while enrolled in vocational agriculture were determined. In addition, the study identified demographic variables that were related to senior's attitudes about experiences in vocational agriculture. The primary purpose of the current study (Phase II) was to determine student attitudes about their experiences in vocational agriculture one year after completing the program and determine if their attitudes are related to their current occupational status.

OBJECTIVES OF THE STUDY

Specifically, the study was designed to:

1. Determine the current status of 1983 program completers of Florida vocational agriculture/agribusiness programs with regard to occupation, further education, economic level, and other pertinent demographic factors.

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2. Compare the current occupational status of 1983 program completers with their pre-graduation occupational plans.

3. Appraise program completer attitudes about experiences in vocational agriculture and compare their attitudes with their pre-graduation opinion of vocational agriculture.

4. Determine if program completer attitudes about the value of vocational agriculture are related to their current occupational status, economic level, further education, and demographic factors.

PROCEDURE

Population Investigated

The study was a descriptive study. The population for the study consisted of all Florida high schools with vocational agriculture programs. In Phase I of the study (Arrington and Price, 1983), each of the 333 senior high school vocational agriculture teachers was asked to have each senior vocational agriculture student complete a brief questionnaire that identified the student's name, address, telephone number, and the number of years enrolled in vocational agriculture. Ninety-three percent of the teachers responded and identified 1848 graduating seniors who had completed at least two years of vocational agriculture. From this list of 1983 program completers, a random sample of 300 students was selected for the Phase II survey.

Instrumentation

In order to obtain requisite information, a mail questionnaire was developed. The questionnaire was a modification of an instrument used in Phase I of the study. A Southern region follow-up study (Iverson and Brown, 1979) questionnaire formed the basis for many of the items included on the questionnaire.

The validity of the content of the instrument was established by a jury of selected staff members and graduate students in the Department of Agricultural and Extension Education and selected State Department of Education personnel. The instrument was pilot tested with a group of senior vocational agriculture students who were not included in the random sample. The information from the pilot test was used to check the clarity of instructions, appropriateness of questions, and other factors that might affect the response rate. The reliability coefficient of the questionnaire was .90.

Data Collection and Analysis

Data for the study were collected in March, 1984. Three follow-up contacts yielded 209 (69 percent) returns. There were 15 students who had moved and could not be reached. Twenty-seven randomly selected non-respondents were contacted and asked to respond to selected items on the questionnaire. An analysis of this information revealed no significant differences between respondents and non-respondents.

Descriptive statistics were utilized to accomplish the first three objectives. For the fourth objective, each of the program evaluation statements was first examined by factor analysis. Categories of evaluation statements were identified and a multiple regression analysis was utilized to examine the relationship between the categories of evaluative statements and occupational status, economic level, further education, and demographic factors.

RESULTS

Objective One

Data collected for objective one revealed that of those responding, the majority were single (97.2 percent) and still living with their parents (74.4 percent). Ninety-seven percent of the respondents were white.

As far as FFA activity, less than three percent of the respondents had not been a member. Approximately 85 percent had been a member of FFA for three years or more. There were 53 (26.5 percent) students who had earned the State FFA degree. Thirty--four (17.0 percent) students had not earned at least a greenhand degree.

Table 1 illustrates that 36.3 percent were employed in a non-agricultural occupation. Slightly more than eight percent were full-time farmers or ranchers and about 14 percent said they were a part-time farmer or rancher. Approximately 29 percent of graduates were attending a college or postsecondary vocational school. Of those attending school, 28.8 percent were studying some area of agriculture. Eighteen (8.8 percent) respondents indicated they were unemployed. However, it should be noted that some of the unemployed were attending college. Over one-half (51.5 percent) of the respondents were involved to some degree with an occupation related to agriculture one year after graduation.

As far as economic status, two-thirds of those who reported an income were making less than $10,000 annually. Over 19 percent had an annual income between $10,000 and $14,999. Slightly over three percent indicated their annual income was over $35,000.

Table 1
Current Occupational Status of
1983 Program Completers
(N=204)

Occupational Categories	Number	Percent
Farm	17	8.3
Farm (part-time)	28	13.7
Agricultural Occupation (other than farming)	105	42.6
Non-Agricultural Occupation	74	36.3
Post-Secondary Vocational School	16	7.8
College	43	21.1
Military	11	5.4
Don't Know	*	*
Unemployed	18	8.8

(*) Percentages add up to more than 100 percent due to multiple responses.

Objective Two

Objective two of the study was designed to compare current occupational status with what students had indicated they planned to do after graduation. Phase I of this study revealed that only 2.6 percent of the seniors planned to be involved in farming (See Table 2). However, 22 percent of the program completers indicated they were engaged in farming on a full-time or part-time basis. There were 105 (42.6 percent) students employed in an agricultural occupation other than farming. Of those, approximately 11 percent were involved in an agribusiness occupation and the same number were involved in ornamental horticulture. Over 12 percent were involved in agricultural mechanics.

Data summarized in Table 2 also illustrate that over 45 percent of the students had indicated they planned to attend college or some other postsecondary school after graduation. However, one year after graduation, only 28.9 percent were attending school on a full-time or part-time basis.

Table 2
COMPARISON OF PLANS AFTER GRADUATION WITH ACTUAL OCCUPATIONAL STATUS

	Pre-graduation Plans N=310		Actual Status N=204	
Occupational Categories	Number	Percent	Number	Percent(1)
Farm	8	2.6	17	8.3
Farm (part-time)	*	*	28	13.7
Agricultural Occupation	35	11.3	105	42.6
Non-Agricultural Occupation	30	9.7	74	36.3
Post-Secondary Vocational School	24	7.7	16	7.8
College	117	37.7	43	21.1
Military	42	13.5	11	5.4
Don't Know	54	17.5	*	*
Unemployed	*	*	18	8.8

(1) Percentages add up to more than 100 percent due to multiple responses.
(*) Not Asked

Objective Three

Objective three sought to determine the attitudes of program completers about their experiences in vocational agriculture and compare post-graduation attitudes with those expressed prior to graduation. To measure program completer attitudes, each person reacted to sixteen statements related to their vocational agriculture experiences. A four-point Likert scale was utilized to categorize responses. Students could strongly agree, agree, disagree, or strongly disagree with each of the items. Frequencies, percentages, and a mean response were computed for each statement.

In general, experiences in vocational agriculture received very high ratings from the seniors (See Table 3). For the statement, "vocational agriculture taught me skills useful in production agriculture", 98.9 percent of the students either agreed or strongly agreed. In comparison, 99.4 percent had agreed or strongly agreed before graduation. When asked "would you enroll in vocational agriculture if you had it to do over again", 96.6 percent of the students responded positively after graduation with 96.8 responding positively before graduation.

There were 121 (59.6 percent) students in agreement that vocational agriculture helped them choose an occupation. Prior to graduation, 73.4 percent of the students had agreed with this statement.

As far as teacher assistance received while in vocational agriculture, 90.3 percent of the graduates indicated their teacher had provided information on careers within agriculture. Ninety-seven percent had responded to this question positively before graduation. These data are summarized in Table 4.

Table 3

RATINGS OF STATEMENTS ABOUT THE VOCATIONAL AGRICULTURE PROGRAM BY STUDENTS BEFORE AND AFTER GRADUATION

Statements About Vocational Agriculture Experiences	Percentages of Responses				
	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean Response
Taught me skills use-in production agriculture	34.00 50.70	65.40 47.30	0.30 1.50	0.30 0.50	3.33 (B) 3.48 (A)
Taught me skills useful in agribusiness and natural resources	24.80 38.50	68.60 51.20	6.40 8.30	0.30 2.00	3.18 (B) 3.26 (A)
Helped me learn how to participate in meetings	38.50 54.60	54.80 36.70	5.80 6.80	1.00 1.20	3.30 (B) 3.44 (A)
Helped me choose an occupation	21.00 22.60	52.40 36.90	25.90 34.90	0.60 5.40	2.94 (B) 2.77 (A)
Helped me develop leadership skills	38.10 48.00	54.50 44.50	7.10 6.00	0.30 1.50	3.31 (B) 3.39 (A)
Helped me understand how to enter and advance in agricultural occupations	29.70 31.03	63.90 52.70	5.80 13.30	0.60 2.90	3.22 (B) 3.12 (A)

Table 3 (continued)

Statements About Vocational Agriculture Experiences	Percentages of Responses Strongly Agree	Agree	Disagree	Strongly Disagree	Mean Response
Helped me to see the need to get along with others on the job	43.40	53.40	3.20	-.--	3.40 (B)
	47.80	43.90	5.40	2.90	3.37 (A)
Helped me learn to work in production agriculture areas like farming, greenhouse plant production, or nursery operations	47.10	51.00	1.90	-.--	3.45 (B)
	53.66	41.95	3.90	.49	3.49 (A)
Helped me learn to work in agribusiness and natural resources areas like sales and services, forestry, or food processing	17.90	62.80	17.90	1.20	2.97 (B)
	30.88	46.57	20.59	1.96	3.06 (A)
Helped me learn to get along with other people	36.30	61.10	2.30	.03	3.34 (B)
	44.12	50.00	4.41	1.47	3.37 (A)
Vocational agriculture classes were good for me	46.50	51.90	1.30	.30	3.44 (B)
	68.45	30.58	.49	.49	3.67 (A)
If I had to do it over I would re-enroll in vocational agriculture	53.50	43.30	2.90	.30	3.50 (B)
	77.30	19.32	2.90	.48	3.73 (A)

*Coded as SA=4, A=3, D=2, and SD=1.
(B)=Before, 1983; (A)=After, 1984.

Table 4
Ratings of Statements about Teacher Assistance by Students Before and After Graduation

Statements About Teacher Assistance	Percentages of Responses				
	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean Response
Encouraged me to enter an occupation in agriculture	28.80	59.60	10.60	1.00	3.16 (B)
	49.03	40.29	7.28	3.40	3.35 (A)
Encouraged me to consider attending college	27.60	49.70	22.10	.60	3.04 (B)
	50.24	31.71	13.66	4.39	3.28 (A)
Provided me with information on careers outside of agriculture	15.70	58.00	25.60	.60	2.88 (B)
	28.78	40.49	22.93	7.80	2.90 (A)
Provided me with information on careers within agriculture	36.90	59.90	3.20	-.--	3.33 (B)
	59.64	30.72	7.23	2.41	3.48 (A)

*Coded as SA=4, A=3, D=2, and SD=1.

Objective Four

Objective four was to determine if student attitudes about the value of vocational agriculture were related to their occupational status, economic level, further education, and demographic factors. Each of the sixteen program evaluation statements was examined by factor analysis. The purpose of the factor analysis was to identify categories of program evaluation statements (constructs). Variables loading .60 or higher on a factor were considered in interpreting the meaning of the factor.

Three factors were identified and are summarized in Table 5. For each factor identified, the factor loading of each questionnaire item is indicated. The three categories of response statements were identified and labeled as: (1) values of the program, (2) instructional program, and (3) career guidance.

Table 5

RESULTS OF FACTOR ANALYSIS OF THE EVALUATIVE RESPONSES

Factor/Item Name	Factor Loading
Factor 1: Values of the Program	
Vo-Ag helped me develop leadership skills.	.67
Vo-Ag helped me learn to get along with others	.66
Vo-Ag classes were good for me.	.70
If I had it to do over again, I would enroll in vocational agriculture.	.62
Factor 2: Instructional Program	
Vo-Ag taught me skills useful in agribusiness and natural resources.	.72
Vo-Ag helped me learn to work in production agriculture areas like farming, greenhouse production or nursery operations.	.60
Vo-Ag helped me learn to work in agribusiness and natural resources areas like forestry, sales and services or food processing.	.68
Factor 3: Career Guidance	
My teacher encouraged me to enter an occupation in agriculture.	.70
My teacher encouraged me to consider attending college.	.76
My teacher provided me with information on careers within agriculture.	.69

To determine whether the independent variables were related to the attitude factors, a step-wise multiple regression analysis was conducted. The three factors identified by factor analysis were used as dependent variables. A probability level of .05 was used to determine if each independent variable significantly contributed to the explanation of variance in each factor.

For the first factor, values of the program, one variable contributed to the variance: highest FFA degree achieved. However, this variable accounted for only a small percentage of the variance (R^2) in this factor.

For the second factor (instructional program) and the third factor (career guidance), none of the independent variables were significantly contributing to variance.

CONCLUSIONS

1. The majority of 1983 vocational agriculture program completers in Florida were involved to some degree in an occupation related to agriculture one year after graduation. When those who continued their education and those who entered the military are added, it accounted for over 70% of the program completers.
2. Program completers had not accurately predicted their post -high school occupational/educational plans.
3. Overall, program completers agreed with their pre-graduation attitudes about their experiences in vocational agriculture. Program completers again indicated very positive attitudes about their experiences.
4. Highest FFA degree earned was significantly contributing to the explanation of variance in the first attitudinal factor, values of the program.

RECOMMENDATIONS FOR FURTHER RESEARCH

1. Additional research should examine 1983 program completers in Florida to determine their attitudes and occupational status at future points in time.
2. Other graduating classes should be examined to determine their attitudes and occupational status.
3. Similiar studies should be conducted in other states to provide further comparative evaluative information on program completers in order to test the results in this study.
4. Other studies should examine employer attitudes about vocational agriculture program completers.

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EVALUATION OF VOCATIONAL AGRICULTURE
A DISCUSSION OF RESEARCH

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INTRODUCTION

From economic, legislative, and political perspectives, evaluation of educational programs is of major concern. If vocational agriculture differs from other educational programs, it is that it may be expected to be more accountable. The general public, other educators, and sometimes our own profession expect vocational agriculture programs to impact students in certain ways and to certain extents, without regard to what may comprise the other nine-tenths of students' waking hours during high school.

Regardless of such misconceptions, we must evaluate programs if we are to be the best we can be. The research reports discussed in this paper deal with evaluation of vocational agriculture. Each report approached the subject from a different perspective with a somewhat different purpose. The papers are: "Assessment of Competencies Possessed by Students in the Fundamentals of Agribusiness and Natural Resources Occupations Program" by Max B. McGhee; "Analysis of the Occupational Attainment of Agricultural Education Graduates of the High School Class of 1972" by Howard R. D. Gordon and William G. Camp; and "Relationship of Occupational Status and Attitudes About Vocational Agriculture" by Larry R. Arrington. Comments made regarding these reports are intended to promote discussion of the research, the methodology employed, and implications of the results.

ASSESSMENT OF COMPETENCIES POSSESSED BY STUDENTS IN THE FUNDAMENTALS OF AGRIBUSINESS AND NATURAL RESOURCES OCCUPATIONS PROGRAM

This research was designed to evaluate achievement in vocational agriculture in relation to a specific set of curriculum materials. Major questions answered were: had students mastered the competencies taught; did grade level, previous enrollment, FFA and SOE participation, and career plans influence achievement; and which competencies were being taught and how much time was devoted to each content area?

This is practical research concerned with the results of a particular curriculum plan. Commendations are due the researcher for asking the question of whether or not students are learning what they are being taught. More of us could benefit by asking the same question. The researcher in a clearly written paper pointed out several major findings: The mean score on what I assume to be a criterion-referenced test was 57%; students in grades 9-12 scored better than students in grade 8; students who had never been in vocational agriculture scored almost as high as previously enrolled students; FFA members scored higher than non-members; students with a SOE scored higher than those not having a SOE; students planning to enter a non-agricultural occupation scored lower than other students; most of the teachers taught less than half of the competencies; and time devoted by teachers to different content areas varied from recommended times by 19% more time in animal science to 49% less time in agricultural mechanics.

With few exceptions, these findings appear to be soundly based. The measuring instrument had a difficulty index of .60 and a discrimination value of .55, both being acceptable even though a higher difficulty value could be desirable for a criterion-referenced test. Reliability coefficients ranged from .58 for the leadership content area and .65 in agribusiness management to .95 for agricultural mechanics, with the prior two areas needing improvement.

Realizing that presenters are limited in size of the paper and, thus, detail, I would raise the following questions:

-Were there differences in the 57 teachers and their students who volunteered and the 133 teachers and their students who did not?
-Were there differences in respondents and non-respondents?
-How well did 60 test items measure 74 competencies? The number of test items is not proportionate to time recommended or number of competencies per area.
-How is the loss of 76 students accounted for between the total N and those shown by grade level?

These questions aside, lets look at the results from another perspective and ask how data from our states would compare (See Tables).

-When total competencies are compared with the number taught by 75% of the teachers, the percent taught ranges from 12.5% in agricultural mechanics to 100% in leadership, with the total percent taught being 46. Are our teachers teaching what should be taught? (Table 1).
-When scores are compared by grade level, we might assume a systematic increase in scores from grades 8 through 12, but this is not supported by the data. (See Table 2). Why do students not learn more each year?
-Comparing scores of students who had never before enrolled in vocational agriculture with those who had previously been enrolled, there was no difference. Why aren't vo-ag students more skilled in agriculture than non-vo-ag students?
-Of the respondents, 58% were FFA members and 62% had SOE programs. These students scored better than those who were not FFA members (42%) and those without SOE programs (38%). If FFA and SOE help students learn, can they be required parts of the program for all students? What percentage of students in your state fail to take advantage of FFA and SOE? Should FFA provide more than a 7% increase and SOE a 3.5% increase in knowledge to participants?
-Since students were tested as if all competencies were taught, would instruction appear to be more effective if the number actually taught was considered? (See Table 3). Based on the percentage of

competencies taught in each area, "assumed" ranked scores were derived and compared with actual ranked scores. The result was a Spearman rank order correlation coefficient of .14.

If we review major items that may have implications for vocational agriculture nationwide, we should ask: Are our teachers teaching? Are our teachers teaching what they should teach? Are our students taking advantage of all vo-ag has to offer? Are our students learning what they should be learning?

This research report is an excellent one to motivate us to provide empirical evidence which describes the outcomes of vocational agriculture programs.

ANALYSIS OF THE OCCUPATIONAL ATTAINMENTS OF AGRICULTURAL EDUCATION GRADUATES OF THE HIGH SCHOOL CLASS OF 1972

One thing we would like to think is that students who complete vocational agriculture programs enjoy a better life than similar students who do not complete vocational agriculture. The significant conclusion of this research is that there was no relationship of practical importance between participation in vocational agriculture and subsequent socioeconomic attainment.

The strengths of this study include the nature of the sample and the analysis technique used. The researchers are to be commended for accessing previously collected data from a national longitudinal study and for accounting for some initial differences between subjects in comparing socioeconomic attainment. Having the work history of subjects over a seven-year period also strengthens the research. (See Figure 1).

Answers to the following questions would help me better understand the significance of the findings.

-How valid are the reports of occupational attainment?
-What is the effect of the 22% mortality?
-What is the estimated sampling error?
-What predictor variables were used in the multiple regression analyses other than semesters of vocational agriculture? To what degree were they associated with attainment?
-How were the terms agricultural education, semi-agricultural education, and non-agricultural education defined?
-On what basis were occupations classified as agricultural and non-agricultural?

In spite of these questions, studies such as this offer many advantages over localized studies. They should be continued with the use of other criterion variables.

RELATIONSHIP OF OCCUPATIONAL STATUS AND ATTITUDES ABOUT VOCATIONAL AGRICULTURE

The most significant findings of this study involve remarkable consistency, as well as astounding changes. In comparing opinions of high school seniors in vocational agriculture with their opinions after graduation, both groups were extremely positive about thier experiences in vocational agriculture. Less than three percent of the seniors planned to farm and a little over 11% planned to work in an agricultural occupation, but after graduation the number actually farming was 300+% greater and those actually working in an agricultural occupation was 370+% greater.

The researcher should be applauded for avoiding some of the common mistakes made in research. He followed up non-respondents to determine the extent of non-response bias and he used factor analysis to reduce the number of dependent variables. Data for the study were collected with a sound instrument with peer-judged validity and a reliability coefficient of .90.

More detailed information would have been helpful in a few cases:

-Which items on the questionnaire were used to test for differences between respondents and non-respondents?
-In the occupational categories, responses total 144%. Can this overlap be made more clear?
-How was the determination made that 51.5% of the responsents were in an agricultural occupation?

SUMMARY

We have seen three studies evaluating vocational agriculture. One seems to indicate that students aren't mastering agricultural skills, the next leads us to believe that participation in vocational agriculture does not lead to higher socioeconomic levels, yet the third provides a very positive testamonial from former students, with almost 97% saying that if they had to do it over they would enroll in vocational agriculture.

This reminds me of the line in a song that asks "if it feels so good, how can it be wrong?" If students are so pleased with vocational agriculture, why are evaluation results not more positive? Could it be that there is a lack of congruence in what we say the program is to do and what we attempt to do? Are there advantages to the program that empirical data have not identified?

There is a need for additional work in evaluating vocational agriculture. We have an opportunity to work together to design evaluative studies which are broader in scope and more structured. There is also a need to do a different type of research that not only asks what, but in an indepth way, asks why.

These three interesting papers provide a good beginning.

TABLE 1

COMPETENCIES TAUGHT BY CONTENT AREA

CONTENT AREA	COMPETENCIES TOTAL	TAUGHT BY 75% OF TEACHERS	
	NUMBER	NUMBER	PERCENT
ANIMAL SCIENCE	19	7	36.8
PLANT SCIENCE	18	10	55.5
AG MECHANICS	16	2	12.5
SOIL SCIENCE	9	6	66.7
AGRIBUSINESS MANAGEMENT	7	4	57.1
LEADERSHIP	5	5	100.0

TABLE 2

SCORES BY GRADE IN SCHOOL

GRADE IN SCHOOL	MEAN SCORE		ASSUMED MEAN SCORE	
	RAW	%	RAW	%
8	26	43	26	43
9	35	58	35	58
10	34	56	40	67
11	34	57	45	75
12	37	61	50	83

TABLE 3

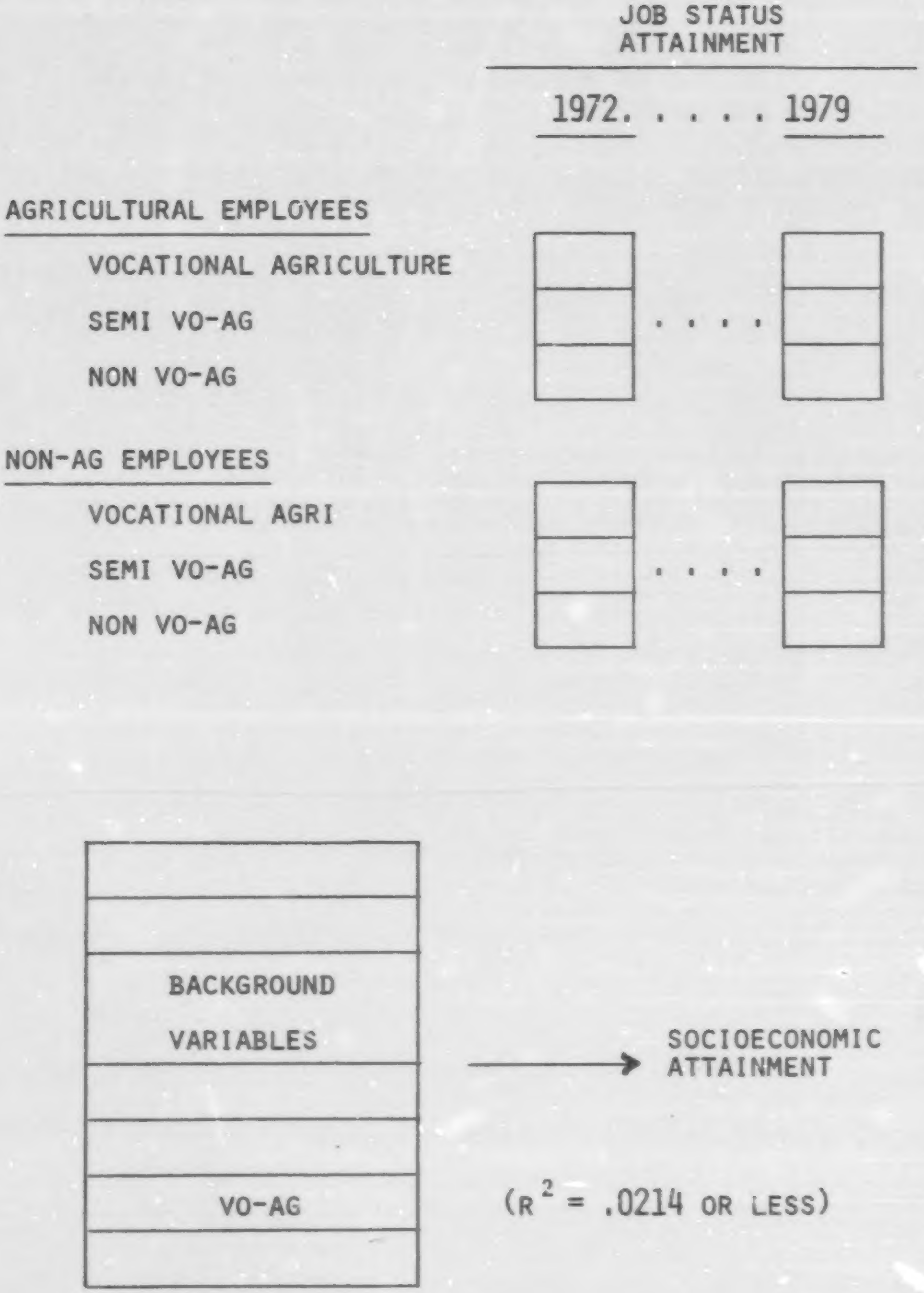
SCORES RANKED BY CONTENT AREA

CONTENT AREA	RANKED SCORES	
	ASSUMED*	ACTUAL
ANIMAL SCIENCE	5	3
PLANT SCIENCE	4	2
AG MECHANICS	6	6
SOIL SCIENCE	2	5
AGRIBUSINESS MANAGEMENT	3	1
LEADERSHIP	1	4

NOTE: SPEARMAN RANK ORDER CORRELATION = .14

*ASSUMED RANKS ARE BASED ON PERCENTAGE OF COMPETENCIES TAUGHT IN EACH AREA.

FIGURE 1


JOB STATUS ATTAINMENT
1972. 1979
AGRICULTURAL EMPLOYEES
VOCATIONAL AGRICULTURE
SEMI VO-AG
NON VO-AG
NON-AG EMPLOYEES
VOCATIONAL AGRI
SEMI VO-AG
NON VO-AG
BACKGROUND VARIABLES
VO-AG
SOCIOECONOMIC ATTAINMENT
(R^2 = .0214 OR LESS)

THEME: TRENDS IN AGRICULTURAL EDUCATION

A CONTENT ANALYSIS OF THE AGRICULTURAL EDUCATION MAGAZINE
1929-1984

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INTRODUCTION

What a profession writes about in its journals and/or magazines might be considered a fairly good indicator of what is perceived as being important to the profession. The breadth, depth and frequency with which certain topics are addressed can give insight into the priorities of a profession.

By reviewing the contents of the Agricultural Education Magazine over time, one can gain an insight into the historical background and thinking that has led the agricultural education profession to its current position on items that appear to be important.

Content analysis as a research technique has been used only in a limited fashion in agricultural education. However, as a research technique, this method has been used extensively in the field of journalism. Berelson (1952) in his book, "Content Analysis in Communication Research," provided the seminal basis from which nearly all current content analysis derives. Three assumptions about content analysis are identified in Berelson's work: (a) that inferences about the relationship between intent and content or between content and effect can validly be made, or the actual relationships established; (b) that study of the manifest content is meaningful; and (c) that the quantitative description of communication content is meaningful.

The key to effective content analysis appears to rest largely in the categories identified for the grouping of data. "Content analysis stands or falls by its categories. Particular studies have been productive to the extent that the categories were clearly formulated and well adapted to the problem and the content. Since the categories contain the substance of the investigation, a content analysis can be no better than its system of categories" (Berelson, 1952). Budd and Thorp (1968) specify three requirements of those categories as follows: (a) they are tailored accurately to fit the needs of the study so that they will provide the answers to the questions asked; (b) they are exhaustive; and (c) they are mutually exclusive. Krippendorff (1980) provides more technical insight into design, unitizing and analysis of data when using a content analysis procedure.

With 659 issues in 55 1/2 volumes, the Agricultural Education Magazine has been the major professional journal for agricultural education since 1929. Beginning with approximately 1500 subscribers at a dollar per year per subscription, the magazine currently has about 5400 subscribers at seven dollars per year per subscription.

From the outset, the focus of the magazine was for teachers. The content and style was intended to be primarily news oriented with results of scientific investigation being regarded as particularly choice news. Some speculative and philosophical material was to be included, but it was stated that space was limited and that it was presumed the readers would resent verbosity and heavy, technical types of writing (Hamlin, 1929).

Readers' reactions to the Agricultural Education Magazine have periodically been solicited as a way to help the magazine provide the kind of information (content) the subscribers reported they wanted and needed (Woodin, 1966, Metzger, 1977). However since 1931, no content analysis has been done to determine what has been and is the direction of the magazine in terms of content (Dickinson, 1931).

PURPOSE AND OBJECTIVES

The purpose of this study was to do a content analysis of the Agricultural Education Magazine from its beginning in January 1929 through December of 1983. To direct this effort, answers were sought to the following questions:

1. What has been the nature of the contents of the articles which have been published in the Agricultural Education Magazine from January 1929 through December 1983?
2. Who have been the leading contributors to the Agricultural Education Magazine and what has been their professional role?
3. What has been the internal structure of the Agricultural Education Magazine and how has it changed over time?
4. What have been the major historical events of the Agricultural Education Magazine?

PROCEDURE

This was a descriptive study using content analysis as the technique to gather data and make appropriate descriptions. All items in the Agricultural Education Magazine from January 1929 through December 1983 served as the source of data. Following is a basic outline of the procedure used in this study:

1. A two phase process for the review of appropriate literature was conducted. One phase dealt with the review of literature related to the methodology of content analysis and the other phase dealt with related efforts in vocational and agricultural education.
2. A determination of the scope of the content analysis to be done was made. After a thorough review of the appropriate sampling procedures and after considering the scope of the magazine over the 55 years of publication, a decision was made to include all content from the inception of the magazine in January 1929 through December 1983.

3. A process for developing an appropriate system of categories for gathering and analyzing data was initiated. The final system adopted for use in this study was a hybrid between the categories that appeared to evolve out of the magazine itself and a structure that was created prior to the analysis based on an intellectual understanding of the profession. The final system for categorizing content is displayed in Appendix A.

4. Two basic instruments were developed for the gathering of the data. One instrument was used to code the items in the magazine by content area (Appendix B). The second instrument was used to gather specific information about the authors and their contribution to the magazine (Appendix C). Both instruments were reviewed by experts in content analysis and both were revised incorporating suggestions and information gained in the testing process.

5. All items in the Agricultural Education Magazine from January 1929 through December 1983 were categorized using the system developed for this process. In addition, data regarding author contributions to the Agricultural Education Magazine were gathered using the instrument in Appendix C. The magazine was also reviewed and notes recorded regarding specific editorial, size, color, format and other changes. Appropriate analysis techniques were used with each phase of this research project.

6. A final report was prepared. The report includes the statistical analysis in terms of the content, a list of the most productive authors over time, theme issue listings by month and year, theme categories and format information. In addition, a listing of the editors, associate editors, consulting editors, business managers and editorial managing board members by beginning and ending dates of service was gathered. Further, other specific items related to the description of the magazine and its development are also a part of the final report.

RESULTS

Fifty-five years of the Agricultural Education Magazine were reviewed. This included 55 1/2 volunes containing 659 issues and 14,102 content items. Three dimensions of the agricultural education profession served as the basis for the categories which were developed for use in coding the items in the magazine. The geographic scope (national and international), the professional role (teacher, teacher educator, supervisor), and responsibilities related to each professional role (Appendix A) are the three dimensions utilized for this study.

Question #1

What has been the nature of the contents of the articles which have been published in the Agricultural Education Magazine from January 1929 through December 1983.

Findings

1. Of the 14,102 items, 8,822 or 63% were specifically targeted to teachers of vocational agriculture.

2. Of the 8,822 items directed at teachers of vocational agriculture, 1,842 or 21% dealt with client groups, 3,156 or 36% dealt with the functions of teachers and 3,824 or 43% dealt with special program components.

3. There were 1,864 items related to student organizations. This represents 49% of the items in special program components, 21% of those items targeted to teachers of vocational agriculture and 13% of all items for the 55 years of the magazine.

4. Items dealing with and for teacher educators accounted for 7% of all items. Two percent of the items dealt with supervisors.

5. About 5% of the items dealt with professionalism, and 1% with international programs.

6. The category identified as professional support accounted for 3,114 items or 22% of the total. Within that category were 1,245 book reviews and 1,660 items in the category of other. These were items which simply did not fit into the categories already identified.

7. In terms of individual categories, the following represent those areas which have received the most attention. Student Organizations (1864), Other (1660), Book Reviews (1245), Adult (1163), SOE Programs (987).

8. Of the 14,102 items in the magazine, 4,008 or 28% appeared in the magazine during 1929 and the 1930's, 2,451 or 17% appeared during the 1940's. 2,609 or 18% appeared during the 1950's, 2,249 or 16% appeared during the 1960's, 2,124 or 15% appeared during the 1970's and 661 or 5% have appeared thus far during the 1980's.

9. In terms of those articles directed at teachers of vocational agriculture, items related to the functions of teachers have become more prevalent while items related to program components have generally become fewer in number.

10. Articles directed at teacher educators and supervisors tended to be more prevalent during the 1960's and 1970's.

11. Most of the items (60%) related to international programs were published during the 1970's.

12. During the 55 years of the Agricultural Education Magazine, 162 items or about 1% have been published about summer programs.

13. During the 55 years of the magazine, 14,109 pictures appeared in the magazine. Of those, 6,557 or 47% were portraits.

Question #2

Who have been the leading contributors to the Agricultural Education Magazine and what have been their professional roles?

Findings

Number of articles, number of book reviews, number of editorials, number of articles and editorials combined and number of all items combined served as the basis for analyzing author contributions.

1. Teachers of vocational agriculture produced about 38% of all the articles written while 33% were written by teacher educators. About 10% were produced by supervisors.

2. About 83% of the book reviews were produced by teacher educators and about 10% were produced by teachers of vocational agriculture.

3. One person, A. P. Davidson, did 263 or 23% of all the book reviews.

4. Teacher educators have written about 82% of the editorials and teachers of vocational agriculture and supervisors produced 5% and 4% respectively.

5. When combining articles and editorials, teacher educators produced 37% of the total items and teachers of vocational agriculture produced 35%. Supervisors accounted for about 10% of the writing productivity.

6. In terms of total contributions to the Agricultural Education Magazine, teacher educators have accounted for 42%, teachers of vocational agriculture have accounted for 32% and supervisors have accounted for 10%.

7. The following persons have been the most productive writers of articles for the magazine: H. M. Hamlin, 71; J. C. Atherton, 46; L. M. Sasman, 42; L. J. Phipps, 41; R. J. Woodin, 41; G. P. Deyoe, 40; Ralph Bender, 37; G. A. Schmidt, 36; S. S. Sutherland, 33; A. H. Krebs, 31.

8. The following persons have been the most productive writers in terms of articles and editorials for the magazine: H. M. Hamlin, 97; H. M. Byram, 68; A. H. Krebs, 68; G. F. Ekstrom, 65; Carsie Hammonds, 65; C. C. Scarborough, 65; R. J. Woodin, 58; J. C. Atherton, 54; W. F. Stewart, 50.

9. About 9% of the author productivity in articles was accounted for by 3% of the authors. In terms of total author productivity, 2% of the authors accounted for 11% of articles and editorials.

Question #3

What has been the internal structure of the Agricultural Education Magazine and how has it changed over time?

Findings

1. The original physical dimensions of the magazine were 8.25 inches by 11.75 inches. The current dimensions are 8.25 inches by 10.75 inches. The dimensions were also changed in 1966, 1978 and again in 1979.

2. From July 1937 through June 1951, the back page of the magazine was used to publish a directory of teacher educators and state supervisors.

3. The basic cover format has been changed ten times since the magazine was initiated in 1929. Following are the dates when the basic cover format was changed: July 1938, August 1946, July 1951, July 1962, July 1964, July 1966, July 1975, January 1976, June 1978 and January 1980.

4. Volume 1 issue 1 began with the January 1929 issue. Beginning in July 1930, volume 3 was initiated, and all volumes since have begun in July.

5. "Picture of the Month" was started in July 1951 and became "Stories in Pictures" in December of 1953.

Question #4

What have been the major historical events of the Agricultural Education Magazine?

Findings

The Agricultural Education Magazine was proposed officially in April of 1928 at the North Central Region Conference in Des Moines, Iowa. Volume 1 was initiated in January of 1929 with H. M. Hamlin as the editor and Z. M. Smith as the business manager. Meredith Publishing Company provided the seed money and printing facilities for the magazine. Since the beginning there have been 23 editors and 4 publishers.

The length of service for the editor has ranged from four months to five years with the most common term being three years. From 1930 to 1946, editors began their terms of service in April of the year. Beginning in 1946, editors began their service in July. This continued until January of 1967 which instituted the current pattern for editors' beginning date of service. The current three year term for editors has been consistent for the past four editors.

When the magazine was originally founded, a consulting editor was one of the original positions on the editorial board. When H. M. Hamlin completed his term as editor, he became the associate editor. Each retiring editor then became the associate editor until W. F. Stewart became the consulting editor, combining the roles of the associate editor and consulting editor into one job. Since that time, the consulting editor has been a retired editor.

Over 170 persons from every state and several territories have served on the editing-managing board.

The following table represents the information related to the subscription rates for the magazine.

Table 1

Subscription Rates for the Agricultural Education Magazine

Subscription Rate	Beginning Date		Ending Date	
$1.00	January	1929	June	1948
$1.50	July	1948	December	1954
$2.00	January	1955	June	1962
$3.00	July	1962	May	1973
$5.00	June	1973	March	1978
$7.00	April	1978	To Present	

The magazine has been fairly stable over time in terms of its editorial policies. The most significant change came in July of 1950 when special topic editors were dropped in favor of regional editors. Perhaps one of the most unusual events that occureed in the publishing of the magazine happened in August-September of 1962 when the magazine had a combined issue for that month. This was due to a shortage of money for the magazine. An issue has been published in every other month since January 1929.

CONCLUSIONS AND/OR RECOMMENDATIONS

1. Almost 2/3 of the articles in the magazine have been aimed directly at teachers of vocational agriculture.

2. More articles have been published in the Agricultural Education Magazine about FFA than any other single subject.

3. Teacher educators have had the major role in the editorial work of the magazine.

4. While there have been some changes in the structure of the magazine, it has remained relatively unchanged for the past 30 years.

5. The editorial style of the magazine can essentially be divided into two groups. From 1929 to 1950, special editors for topic areas were the rule and from 1950 to the present, regional editors with theme issues have been utilized.

6. During the first decade, the magazine tended to have more items that were shorter in length. From the 1940's until the present, the general number of items have been relatively constant.

7. Generally, summer programs have been written about in only a limited fashion.

8. More articles for the magazine have been authored by teachers of vocational agriculture than any other group.

9. When considering all aspects of the magazine, teacher educators have been the most productive contributors as a group.

10. Several trends identified in this study which relate to such topics as summer programs, authorship of articles and orientation of article content merit further study.

11. Content analysis as a research technique would appear to be appropriate to use in Agricultural Education as a way of looking at the priorities the profession has set and continues to set for itself.

12. Several writers such as H. M. Hamlin appear to have had a great influence on the content of the magazine, and a study devoted to their writings could provide interesting insight and perhaps even direction for future consideration for agricultural education.

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APPENDIX A

PROFESSION: AGRICULTURAL EDUCATION

JOURNAL: AGRICULTURAL EDUCATION MAGAZINE

GEOGRAPHIC SCOPE: NATIONAL International

PROFESSIONAL ROLE: TEACHER EDUCATORS TEACHERS SUPERVISORS

		CLIENT GROUP	FUNCTIONS	PROG. COMPONENTS	
	Teacher Education				Adm. & Sup.
RESPONSIBILITIES :	Found. and Trends	Elementary	Teacher Role	Summer Programs	Prog. Dev.
	Research	Jr. High	Plan & Eval	Student Organiz.	
		Secondary	CURRICULUM	S.O.E.P.	
		Post-Second.	Cur. Devel	Ag. Mechanics	
		Adult	Ag. Subj.		
		Sepcial Needs	INSTRUCTION		
		Part-Time	Methods		
			Aids		
			Relationships		
			Student Eval.		
			Student Serv.		
			Career Educ.		
			Facil. Plan.		

Professionalism

PROFESSIONAL SUPPORT: Book Reviews Biorgraphies Other

APPENDIX B

AGRICULTURAL EDUCATION MAGAZINE

ARTICLE CATEGORIES

VOLUME____

TEACHERS

Client Groups

____Elementary
____Junior High
____Secondary
____Post-Secondary
____Adult
____Special Needs
____Part-Time

Functions

____Teacher Role
____Program Plan & Eval
____Curriculum Development
____Ag. Subject Matter
____Teaching Methods
____Teaching Aids
____Relationships
____Student Evaluation
____Student Services
____Career Education
____Facilities Planning

Program Components

____Summer Programs
____Student Organizations
____S.O.E.P.
____Ag. Mechanics

TEACHER EDUCATORS

____Teacher Education
____Foundations and Trends
____Research

SUPERVISOR

____Program Administration and Supervision
____Program Development

____Professionalism

____International Programs

PROFESSIONAL SUPPORT

____Book Reviews
____Biorgraphies
____Other

APPENDIX C

ARTILCE CATEGORY:________________________________

____

VOLUME	NUMBER OF ITEMS	VOLUME	NUMBER OF ITEMS	VOLUME	NUMBER OF ITEMS
1	___	2	___	3	___
4	___	5	___	6	___
7	___	8	___	9	___
10	___	11	___	12	___
13	___	14	___	15	___
16	___	17	___	18	___
19	___	20	___	21	___
22	___	23	___	24	___
25	___	26	___	27	___
28	___	29	___	30	___
31	___	32	___	33	___
34	___	35	___	36	___
37	___	38	___	39	___
40	___	41	___	42	___
43	___	44	___	45	___
46	___	47	___	48	___
49	___	50	___	51	___
52	___	53	___	54	___
55	___	56	___		

APPENDIX D

ARTICLES BY CONTENT AREA IN THE AGRICULTURAL EDUCATION MAGAZINE
1929-1984

CONTENT CATEGORIES	NUMBER OF ARTICLES	PERCENT
TEACHERS	8822	62.56
Client Groups	1842	13.06
Elementary	19	.13
Junior High	9	.06
Secondary	235	1.67
Post-Secondary	118	.84
Adult	1163	8.25
Special Needs	127	.90
Part-Time	171	1.21
Functions	3156	22.38
Teacher Role	303	2.15
Program Planning and Evaluation	447	3.17
Curriculum Development	218	1.55
Agricultural Subject Matter	203	1.44
Teaching Methods	643	4.56
Teaching Aids	294	2.08
Relationships	479	3.40
Student Evaluation	81	.57
Student Services	278	1.97
Career Education	132	.94
Facilities Planning	78	.55
Program Components	3824	27.12
Summer Programs	162	1.15
Student Organizations	1864	13.22
Supervised Occupational Experience Prog.	987	7.00
Agricultural Mechanics	811	5.75
TEACHER EDUCATORS	980	6.95
Teacher Education	427	3.03
Foundation and Trends	453	3.21
Research	100	.71
SUPERVISORS	320	2.27
Program Administration and Supervision	207	1.47
Program Development	113	.80
PROFESSIONALISM	747	5.30
INTERNATIONAL PROGRAMS	119	.84
PROFESSIONAL SUPPORT	3114	22.08
Book Reviews	1245	8.83
Biographies	209	1.48
Other	1660	11.77
TOTAL	14102	100.00

ADMINISTRATORS' PERCEPTIONS OF NATIONAL ISSUES IN AGRICULTURAL EDUCATION

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INTRODUCTION

As a formal discipline, agricultural education has been in existence at least 60 years and during that time its purpose has changed as the society it serves has changed. Two recent trends have caused revolutionary change in the agricultural society: dichotomized farm demographics and an increasing need for high technology in agriculture. These two changes have precipitated the need for agricultural education to reevaluate its purpose, scope, and clientele.

Recognizing the need, the participants at the 1980 National Agricultural Education seminar identified six major areas deemed most worthy of further study: program mission, clientele served, program content, supervised occupational experience/practice, the FFA, and the program titles. Sutphin (1981) then identified feasible options for each issue and surveyed teachers, teacher educators, and state supervisors to determine their perceptions of the options. The 86 participants surveyed in the Sutphin study were identified as experts in their fields and came from a national population. Sutphin collected data through a three round, modified Delphi approach. The results of the Sutphin study are used in this report to give the perceptions of teachers, teacher educators, and state supervisors.

Significant research exists which documents the need to study local administrators (Gott, 1980; Burnett, 1983; Warmbrod, 1979; Stewart et al., 1983; Miller and Krill, 1984). Local administrators represent an important group to study because they present a fresh, outsider's perspective and they have significant control over local programs.

PURPOSE

The primary purpose of this study was to ascertain the extent to which choices on nine selected issues in agricultural education in the public school system were acceptable to principals and superintendents. Specific research questions were:

1. What is the level of acceptance among principals and superintendents towards various choices of selected national issues?
2. What is the extent of agreement or disagreement among principals, superintendents, teachers, teacher educators, and state supervisors towards various choices of selected national issues?

PROCEDURES

A list of potential participants was developed through nominations from three individuals in each state: (1) the state president of the National Association of Secondary School Principals, (2) the chief officer of the Chartered State Association of School Administrators, and (3) the chief school officer, or state supervisor of agricultural education. These individuals each nominated five principals and five superintendents who were dedicated to their programs and knowledgeable about vocational agriculture. Eight hundred and seventy-five administrators were nominated for a desired sample size of 300. The number of participants selected from each state was proportional to the number of public secondary school vocational agriculture programs in that state.

Data were collected through a two part survey instrument. Part I collected demographic information. Part II consisted of nine important national concerns in agricultural education and a series of options which may include the solution to each concern. These issues were identified by the participants at the 1980 National Agricultural Education Seminar and then validated by Sutphin (1981) through a jury process. Participants were required to respond to each issue by stating their degree of agreement or disagreement on a six point Likert type scale ranging from one (strongly disagree) to six (strongly agree).

RESULTS

One hundred sixty-three principals and 130 superintendents responded to the survey instruments. Principals and superintendents agreed with 91 percent of the choices presented. The groups, principals and superintendents, displayed a different level of agreement on issues in seven instances. An analysis of differing levels of agreement due to region of country revealed that differences occurred in 34 instances (7%) out of a potential 474 instances. The greatest number of differences occurred between administrators from the Western and Southern regions. Administrators from the North Atlantic region displayed the highest degree of congruence with administrators from all other regions.

A comparison of principals and superintendents with the teachers, teacher educators, and state supervisors studied by Sutphin (1981) revealed differences between these five groups. See Table 1 for a summary of responses. Perceived differences between these groups should be analyzed carefully because of the different research methods employed in the two different studies.

CONCLUSIONS

The following conclusions were drawn from the analysis and interpretation of the data in this study:

1. Principals and superintendents considered avocational education to be a purpose of agricultural education while teachers, teacher educators, and state supervisors did not.

Table 1. Percent agreement among educator groups with selected national issues in agricultural education

Issue/Option	Percent agreement				
	Teachers[a]	Teacher educators	State supervisors	Principals	Superintendent
PURPOSE OF AGRICULTURAL EDUCATION	N=23	N=37	N=26	N=163	N=130
General education of an avocational nature	39.1	43.2	26.9	86.5	73.1
Orientation and exploration	100.0	100.0	100.0	96.9	95.4
Preparation for advanced study at the post-secondary level	95.7	97.3	92.3	87.7	85.4
Preparation for advanced study at the baccalaureate level	69.6	91.9	88.5	82.8	80.0
Preparation for employment or self-employment	100.0	100.0	100.0	95.1	90.0
Up-grading and retraining	95.7	97.3	100.0	71.8	70.0
To develop the "Total Individual"	100.0	100.0	100.0	90.2	87.7
Develop the abilities of individuals to be intelligent consumers	73.9	78.4	61.5	85.3	77.7
CLIENTELE WHO SHOULD BE SERVED BY AGRICULTURAL EDUCATION					
Students in grades K-6	52.2	37.8	52.0	42.3	30.8

Students in grades 7-8	69.6	81.1	65.4	70.6	64.6
Students in grades 9-10	100.0	100.0	100.0	98.2	96.2
Students in grades 11-12	100.0	97.3	100.0	96.9	98.5
Out-of school youth	87.0	100.0	92.3	65.0	70.8
Adults seeking employment in occupations requiring knowledge and skill in agriculture	91.3	97.3	96.2	66.3	72.3
Out-of-school youth or adults who desire knowledge and skill in agriculture for personal reasons	65[illegible]	56.8	50.0	54.6	55.4
Rural students	100.0	100.0	100.0	98.2	96.9
Urban students	100.0	100.0	100.0	85.9	80.0
Suburban students	100.0	97.2	100.0	85.9	83.1
In-school youth with social, physical, and economic handicaps	100.0	100.0	100.0	81.6	83.8
Out-of-school youth and adults with social, physical, and economic handicaps	52.2	91.7	88.0	44.2	56.2
Females	100.0	100.0	96.0	85.9	91.5
CONTENT OF AGRICULTURAL EDUCATION					
Agricultural production	100.0	100.0	100.0	98.8	97.7
Agricultural supplies and service	100.0	100.0	100.0	98.2	96.9

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[a] Teacher, teacher educator, and state supervisor data produced by Sutphin (1981).

Table 1. (Continued)

Issue/Option	Percent agreement				
	Teachers	Teacher educators	State supervisors	Principals	Superintendents
	N=23	N=37	N=26	N=163	N=130
Agricultural mechanics	100.0	100.0	100.0	97.5	94.6
Agricultural products	100.0	100.0	100.0	98.8	96.9
Ornamental horticulture	100.0	100.0	100.0	90.8	90.8
Horticulture	100.0	100.0	100.0	96.3	94.6
Renewable natural resources	100.0	97.3	100.0	96.3	96.2
Forestry	95.5	97.3	100.0	90.2	89.2
Other types of agriculture	95.5	97.3	96.2	90.8	87.7
CLIENTELE WHO SHOULD BE REQUIRED TO CONDUCT SUPERVISED OCCUPATIONAL EXPERIENCE/PRACTICE PROGRAMS					
All vocational students enrolled in a production agricultural course of study	95.7	100.0	100.0	86.5	86.2
All vocational students enrolled in a non-production agriculture course of study	95.7	97.3	100.0	65.6	63.8

Students enrolled in non-vocational agricultural education programs	26.1	25.0	19.2	44.2	37.7
Students enrolled in classes for orientation to agriculture such as in grades 7 and 8	27.3	22.2	23.1	30.7	27.7
Students receiving agricultural instruction in grades K-6	9.1	8.3	20.0	13.5	13.8
ACCEPTABLE TYPES OF SUPERVISED OCCUPATIONAL EXPERIENCE/PRACTICE FOR STUDENTS ENROLLED IN A PRODUCTION AGRICULTURAL PROGRAM					
Supervised farming projects (enterprises)	100.0	100.0	100.0	95.7	94.6
Home and/or farm improvement projects	100.0	100.0	88.5	94.5	93.8
Supplementary farm projects	100.0	100.0	88.5	93.9	91.5
Group projects related to production agriculture	100.0	94.6	92.3	88.3	90.8
Projects of an entrepreneurial (ownership) nature	100.0	100.0	100.0	90.8	90.0
Projects related to the specialty area in which the student is enrolled	95.7	100.0	100.0	95.7	93.8
Farm placement	100.0	100.0	96.2	86.5	86.2

Table 1. (Continued)

Issue/Option	Percent agreement				
	Teachers	Teacher educators	State supervisors	Principals	Superintendents
	N=23	N=37	N=26	N=163	N=130
Practice/experience in the school laboratory, on the school grounds, or farm separate from scheduled in-school instruction	100.0	100.0	96.2	87.7	88.5
Practice/experience in the school laboratory, on the school grounds, or farm during class time	69.6	59.5	76.9	77.3	77.7
Exploratory experiences	73.9	75.7	80.0	86.5	84.6
Cooperative education programs	95.7	97.3	100.0	73.0	67.7
ACCEPTABLE TYPES OF SUPERVISED OCCUPATIONAL EXPERIENCE/PRACTICE FOR STUDENTS ENROLLED IN NON-PRODUCTION AGRICULTURE					
Home projects of non-production nature	100.0	91.9	84.6	83.4	78.5
Placement in agribusiness	100.0	100.0	100.0	89.0	92.3
Group projects of a non-production agriculture nature	95.2	94.6	96.2	77.9	78.5

Projects of an entrepreneutial (ownership) nature	100.0	100.0	100.0	82.2	85.4
Projects related exclusive to the specialty area in which the student is enrolled	91.3	97.3	100.0	83.4	84.6
Practice/experience in the laboratory, on the school grounds, or farm separate from scheduled in-school instruction	95.2	97.3	96.2	82.2	85.4
Practice/experience in the laboratory, on the school grounds, or farm during class time	60.9	54.1	80.8	72.4	72.3
Exploratory exercise	73.9	78.4	76.9	83.4	80.8
Cooperative education programs in agriculture	95.7	97.3	100.0	65.0	61.5
CLIENTELE ENROLLED IN AGRICULTURAL EDUCATION WHO SHOULD BE MEMBERS OF THE FFA					
All vocational students in production agriculture	95.7	97.3	92.3	88.3	82.3
All vocational students in non-production agriculture	95.7	97.3	92.3	81.6	74.6
Vocational students in an orientation to agriculture course of study such as 7th and 8th grade programs	26.1	33.3	19.2	60.7	53.3

Table 1. (Continued)

Issue/Option	Percent agreement				
	Teachers	Teacher educators	State supervisors	Principals	Superintendents
	N=23	N=37	N=26	N=163	N=130
Only those vocational students who desire to become members	26.1	22.2	23.1	54.6	64.6
Avocational students	43.5	44.4	19.2	53.4	63.1
ASPECTS OF THE FFA PROGRAM WHICH WHOULD OCCUPY IN-CLASS INSTRUCTIONAL TIME					
Planning any FFA activity	82.6	78.4	92.3	65.6	59.2
Conducting any FFA activity in the chapter program of activities	52.2	45.9	69.2	58.9	52.3
Selected FFA activities which directly relate to the specialty area of instruction	100.0	94.6	96.2	82.8	83.1
FFA activities which may not directly relate to the specialty area in which the student is enrolled	91.3	86.5	100.0	44.8	46.9
Selected FFA activities which can be utilized without taking time needed to teach content of the instructional program	100.0	89.2	100.0	76.7	73.8

Preparation for judging contests related to the specialty area in which the student is enrolled	100.0	86.5	92.3	89.0	85.4
Preparation for any judging contest	43.5	18.9	53.8	68.1	66.9
Activities specifically selected to develop leadership, citizenship, and cooperation	100.0	100.0	100.0	90.2	88.5
Record keeping for individual and chapter awards	100.0	89.2	100.0	74.8	64.6
Preparation of individual award applications	87.0	54.1	80.9	60.7	55.4
Fund raising projects which use minimal class time that relate to agriculture, have educational value, and are conducted according to sound business practices	100.0	83.8	100.0	58.9	59.2
THE TITLE WHICH SHOULD BE USED TO DESCRIBE AGRICULTURAL EDUCATION PROGRAMS					
Vocational agriculture	56.5	67.6	52.0	77.9	66.2
Agricultural education	4.3	16.2	16.0	79.1	66.9
Agriculture/agribusiness/natural resources education	0.0	0.0	0.0	58.3	61.5

Table 1. (Continued)

Issue/Option	Percent agreement				
	Teachers[a]	Teacher Educators	State Supervisors	Principals	Superintendents
	N=23	N=37	N=26	N=163	N=130
Vocational-technical education in agriculture	0.0	0.0	0.0	54.6	50.8
Agricultural education and renewable natural resources	0.0	0.0	0.0	46.6	40.8
Vocational agriculture/agribusiness	39.1	16.2	32.0	65.0	66.2
Agricultural and natural resources education	0.0	0.0	0.0	60.7	53.1
Agriculture/agribusiness education	0.0	0.0	0.0	73.0	69.2

2. A greater number of teachers, teacher educators, and state supervisors as opposed to principals and superintendents felt agricultural education should serve out-of-school youth and adults, and handicapped individuals.
3. More teachers, teacher educators, and state supervisors, when compared to principals and superintendents, felt all vocational students should be required to conduct an SOE project.
4. More teachers, teacher educators, and state supervisors, when compared to principals and superintendents, approved cooperative SOE projects which involved school release time.
5. More principals and superintendents, as opposed to teachers, teacher educators, and state supervisors felt that only those vocational students who desire to become FFA members should be members.
6. More principals and superintendents, as opposed to teachers, teacher educators, and state supervisors felt many FFA activities were inappropriate for in-class instructional time.
7. Principals and superintendents from the Northeast region exhibited the highest degree of homogeneity when principals and superintendents from all other regions of the country.
8. Principals and superintendents from the Western and Central regions exhibited the highest degree of incongruence with each other, especially when considering FFA activities and membership.

RECOMMENDATIONS

The five groups examined in this study did not agree on some issues. Where differences exist between administrator perceptions and the perceptions of other educator groups, agricultural educators may find more success in the implementation of their policies by giving administrator perceptions prior consideration. The perceptions of administrators, as opposed to those of teacher educators and state supervisors, may more truly reflect the current school situation. For these reasons, it is recommended that members from administration be consulted during policy development, and it is recommended that members from administration be included on national policy boards (the Nation Council, for example).

Agricultural education traditionally serves family farms, a group which no longer represents the largest number of farmers and which no longer produces the largest amount of food (Kolmer and Lasley, 1983). Small farms (under 50 acres) are now most numerous and these farmers are usually classified "avocational." Their activity may be economically and socially significant, yet some educator groups feel agricultural education should not serve this group.

To remain responsive to the changing needs of the agricultural society, leaders in agricultural education should discover the needs of clientele in the avocational group, and researchers should discover the methods best suited to meeting those needs. All educator groups should encourage the development of programs and courses which specifically address the needs of the avocational agriculture clientele group.

The group which produces most of the agricultural produce, operators of large farms and agricultural businesses, may not be served by traditional vocational agticulture. These people require a comprehensive, highly technical form of education that is beyond the scope of a secondary school program. A post-secondary or university education better serves the needs of this group. A secondary school program may not be preparing them for agribusiness and, potentially, may hinder college enrollment by keeping students out of college preparatory courses. All educator groups should adapt their programs to meet the needs of this group. Administrators and teachers should encourage these students to pursue college preparatory courses. Teacher educators and state supervisors should encourage teachers to teach broad, scientific principles rather than parochial skills.

Agricultural education may better serve the needs of some students by discouraging their participation in occupational experience programs during school time. College bound students with an agribusiness orientation will receive greater reward from academic preparation rather than work experience. Many other students may have higher priorities than the business or economic aspects of agriculture. A student interested in becoming a veterinarian, for example, or a student interested in development work in a third world country may be better served by academic preparation rather than work experience. This recommendation is consistent with public demand for a return to "basics" in education.

Education groups discussed in this study displayed differences about the clientele and activities of FFA. Some of the differences seen may be attributable to the traditional, production agriculture orientation of FFA. McCracken and Newcomb (1982) mention some obsolete FFA activities should be changed: the unrepresentative name, "archaic rituals," and outmoded styles of clothing. Drake (1982) also questions the contemporary relevance of many FFA sacrosanct activities. As it presently stands, FFA represents traditional production agriculture but it may ostracize nontraditional programs and students. North Atlantic, and especially, Western region programs may not be encouraged to participate in an organization which, they feel, does not represent their interests. Therefore, the leaders in FFA should modify the program so that it represents contemporary agricultural society.

A national policy statement should be issued indicating that agricultural education at the secondary level is no longer restricted to vocational preparation for students entering the work force upon graduation from high school. In another era it may have been appropriate for individuals to enter the labor force instead of pursuing further education. Today, however, most of society's rewards are more readily accessible to individuals with further education and higher education is no longer withheld from individuals without economic resources. The alternative to this policy would be a reaffirmance of agricultural educations' vocational orientation. Agricultural education would then be doing injustice to "track" a student into a vocational program when the student has the interest or potential for post-secondary education. College preparatory students should be discouraged from participating in this type of a program and vocational agriculture would then be considered a program for students not capable of attending post-secondary education.

It follows from the previous discussion that the title "vocational agriculture" is too narrow to define a high school program. Therefore, programs should be renamed with a more inclusive title such as "agricultural education."

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IDENTIFICATION OF PROFESSIONAL COMPETENCIES NEEDED BY STUDENTS IN AGRICULTURAL EDUCATION PURSUING AGRICULTURAL CAREERS IN NON-SCHOOL SETTINGS

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INTRODUCTION

Graduates from departments or undergraduate programs of agricultural education have pursued agricultural careers in several different occupational areas. Studies by Cottrell, Bennett, Cameron, Chase, Molnar, and Wilson (1971), and Herring (1976) have identified competencies needed by students in agricultural education pursuing careers in school settings. The results of those and other studies provided departments or programs of agricultural education with the information that was needed in order to determine what curriculum content was most relevant to students pursuing careers in teaching vocational agriculture. However, no literature was identified by the investigator that revealed what curriculum content was relevant to the needs of students in agricultural education pursuing agricultural careers in non-school settings. Studies, such as those by Craig (1982), and Herring and Curry (1982), indicated that many graduates from agricultural education were currently or most recently employed in agricultural positions in non-school settings, but the role that agricultural education filled relative to their employment was not determined.

In an effort to determine what should be included in the curriculum for agricultural education to be most relevant to students pursuing agricultural careers in non-school settings, the author conducted a study to identify professional competencies needed by such students.

PURPOSE AND OBJECTIVES

The central purpose of this study was to determine which competencies were needed by undergraduate students in agricultural education who desire to pursue agricultural careers in non-school settings. Three objectives were implemented to accomplish that purpose:

1. Identify competencies that were relative to non-school settings in which graduates in agricultural education (B.S. degree) have been employed.
2. Determine which competencies were considered necessary to students in agricultural education who were pursuing agricultural careers in non-school settings as perceived by persons in agricultural industries or organizations who were in a position to be knowledgeable of the competencies that were needed by those students.
3. Determine which competencies were needed by students in agricultural education regardless of whether they pursued agricultural careers in non-school settings or school settings.

The study was delimited to data gathered in 1983 from 23 representatives of agricultural industries or organizations who have employed graduates from programs of agricultural education. A further delimitation involved the identification of competencies that were included in curricula for teacher education. Those competencies were included in the curriculum for teacher education at Texas A&M University. However the generalizability of those competencies is increased when two factors are considered: the teacher education curriculum at Texas A&M evolved from national competency studies (Cottrell, C.J. et. al. 1971); and most of the competencies identified in this study that are included in the teacher education curriculum at Texas A&M University have been identified in other competency studies such as those by Cheek & Beeman, 1978 and Courtney & Halfin, 1969.

PROCEDURES

A review of relevant literature provided a theoretical base from which the methodology for the study was developed. Requisite information for the study was obtained through a modification of the Delphi technique (Dalkey, 1969) that involved three phases to address the two research questions: (1) What competencies were needed by students in agricultural education who were pursuing agricultural careers in non-school settings? (2) What competencies were needed both by students in agricultural education pursuing careers in school settings and by students pursuing agricultural careers in non-school settings (competencies that were already included in existing curricula for teacher education)? The Delphi procedure was determined to be an appropriate technique to use for the study primarily because of the lack of a theoretical framework for the subject of the study and also for the following reasons suggested by Moore & Coke, 1977: the subject for study does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis; the Delphi technique does not require the time and costs that group meetings often impose; the need for heterogeneity among participants must be pursued to assure validity of results (other techniques that require participants to meet together often allow a participant to bias the other participants). Helmer (1967) indicated that when a theory base for a particular topic was very limited or did not exist the Delphi procedure could be used to help establish one.

In the first phase of the Delphi process a questionnaire that included "closed response" and "open response" items was sent to a panel of twenty-three representatives or "experts" from agricultural industries or organizations. The competencies that were included in the first instrument were identified:

1. Through a review of literature.
2. By graduates from agricultural education (1976-1980) who were employed in non-school settings in agriculture.
3. By a panel of teacher educators and doctoral students in agricultural education.
4. By the Advisory Committee for the General Agricultural program in the Department of Agricultural Education at Texas A&M University.

The Delphi panel of "experts" (the representatives of agricultural organizations or industries) was selected by the Advisory Committee for the undergraduate General Agriculture program at Texas A&M University (Table 1). The second phase involved sending a second questionnaire, which was basically a "closed response" instrument, to the "panel." Those competencies and comments identified or made by panel members in responding to the first questionnaire were included along with a summary of how the "panel" rated the initial competencies in the second questionnaire. In the third and final phase panel members were given another opportunity to review the group responses and change their own if so desired. Data from the study were analyzed using the Statistical Package for Social Sciences (Nie, 1975).

Table 1

Respondents by Occupation and Degree of Participation

	Number Participating		
Occupation	Round 1	Round 2	Round 3
Agribusiness	6	5*	6
Agricultural Credit	4	4	4
Production Agriculture	1	1	1
Agricultural Extension	3	3	3
Other Agricultural Service	9	8**	8
	23	21	22

* One went on business trip after Round 1 but returned for Round 3
** One went on vacation after Round 1

RESULTS

The results from the analyses of data were summarized as follows:

1. One hundred and twenty-two competencies were identified in the study.
2. All of the competencies that received a consensus rating (Table 2) were within six of the fifteen categories: Speech, Mass Communications, Professional and Personal Development, Business Relations, Planned Change, and Sociology.
3. All of the competencies in three categories were classified as "needed": Instructional Techniques, Professional and Personal Development, and Planned Change.
4. More than half (52.5%) of the competencies were classified as "needed" (see Table 3).
5. Approximately one-third (31.4%) of the competencies were classified as "might be needed" (see Table 4).
6. Less than a fifth (15.6%) of the competencies were classified as "not needed" (see Table 5).
7. Almost three-fifths (59.8%) of the competencies were also included in curricula for teacher education.
8. The category for Legal competencies included the most competencies that were classified as "not needed".
9. The "panel" identified approximately one-fourth (26.4%) of the total 122 competencies utilized in the study.

Table 2

Competencies that Received a Complete Consensus Rating by Delphi Respondents by Round Included and Round Consensus was Reached

Competency	Round Included	Round Consensus[+]
Manage time efficiently	1	1
*Develop positive working relationships with other employees and employers	1	1
Develop positive image of self	1	1
*Gain confidence of other employees and employers	1	1
*Recognize and use ethics of a profession	1	1
*Develop and illustrate ideas through speech	1	2
*Recognize and react to verbal and non-verbal cues from the audience	1	2
*Write correspondence letters and memoranda	1	2
*Implement plans to achieve goals	1	2
*Understand and work within the structure of the organization	1	2
*Develop and utilize strategies to promote or prevent change	1	2
*Understand factors associated with rural lifestyles and occupations	1	2
Inform, stimulate, and persuade audiences through speech	1	3
*Know what appropriate appearance and dress is for different organization purposes	2	2
*Develop one's own leadership ability	2	2

Table 2 (cont.)

Competency	Round Included	Round Consensus +
Utilize telephones effectively and efficiently	2	2
Handle and function under pressure or stress	2	2
*Communicate in a concise and clear manner without being offensive	2	2
*Keep current with knowledge and events which may have an impact on clients	2	2
*Develop listening skills	2	2
Understand the reluctance to change and deal with objections	2	2
Effectively interact on a one to one basis	2	3

+ Consensus = a competency was rated important or essential by all respondents

* Included in the Teacher Education Curriculum

Table 3

Competencies Classified as "Needed" that Received Essential or Important Ratings by Seventy-five Percent or More of the Delphi Respondents (Some Examples)

Competency	Rated as Essential or Important (%)
*Understand and utilize different questioning techniques	81.8
*Lead a discussion	95.5
Lead a focus group to obtain information	77.2
*Use different teaching methods with different audiences	81.8

Table 3 (cont.)

Competency	Rated as Essential or Important (%)
*Organize and conduct farm/business tours, trips, or field days	81.8
*Identify and effectively use resource persons when available	90.9
*Develop business relationships with prospective clients	81.8
Handle customer or client complaints	86.3
Recognize need for and factors associated with effective persistence	86.3
Set personal goals	95.5
Recognize need for and factors associated with personal motivation	90.9
*Recognize and develop leadership potential of employees	90.9
*Delegate responsibilities	95.5
*Work within budgets	90.9
Implement contingency plans	90.9
Understand dealer/client financial situations	77.2
*Develop budgets	77.2
*Recognize and fill the role of a change agent	90.9
Recognize barriers to change	86.3
*Analyze community situations for factors that effect change efforts	86.3
Work with organizations, institutions, or agencies that serve communities	90.9
*Understand capabilities and limitations of computers	86.3

*Included in the Teacher Education Curriculum.

Table 4

Competencies Classified as "Might Be Needed" that Received Essential, Important, or Moderately Important Ratings by Seventy-five Percent or More of the Delphi Respondents (Some Examples)

Competency	Rated as Essential or Important or Mod. Imp. (%)
*Utilize audio-visual aids (tapes, transparencies, etc.)	81.9
Cope with adverse publicity	95.6
*Determine most effective mass media in presenting materials	90.9
*Provide for the first aid needs of other employees	95.5
*Develop and/or utilize a lay advisory council	77.2
*Understand developmental stages of youth	81.8
Be familiar with liability and slander laws	77.3
*Do simple programming	90.9
*Use word processing	95.5
Utilize management and marketing consultant services effectively	95.5
Prepare financial statements	86.3
*Conduct surveys	86.3

*Included in the Teacher Education Curriculum

Table 5

Competencies Classified as "Not Needed" that Received
Essential, Important, or Moderately Important
Ratings by Less than Seventy-five Percent
of the Delphi Respondents
(Some Examples)

Competency	Rated as Essential or Important or Mod. Imp. (%)
Communicate in more than one language	13.6
Write research reports in lay terms	68.2
Interpret different sales programs	72.9
Project sales	72.9
Interpret statistical vocabulary and symbols used in reporting research	63.6
Work with labor organizations	27.2
Understand labor laws	50.0
Be familiar with laws affecting real estate	59.1
*Teach others how to use computers	72.7
Use microfiche readers	18.1

*Included in the Teacher Education Curriculum

CONCLUSIONS AND RECOMMENDATIONS

The conclusions were drawn and discussed relative to the two research questions addressed by the study and supported by the findings. Both involved obtaining the perceptions of representatives from agricultural industries or organizations.

The following conclusions were drawn relative to the first research question (What competencies were perceived to be needed by students pursuing agricultural careers in non-school settings?):

1. There were competencies that were needed by students in agricultural education who pursue agricultural careers in non-school settings that were not currently included in curricula for teacher education. The industry representatives identified 22 such competencies that were classified as "needed" (including the competencies that received a consensus rating).
2. There were competencies that were generic to the needs of students in agricultural education who pursue agricultural careers in non-school settings regardless of what other

setting in agriculture that may be. The representatives reached a consensus agreement on the importance of 22 competencies to students pursuing careers in their (the representatives') respective occupational areas of expertise.

3. The competencies that were perceived by all of the representatives (consensus) to be important or essential to the students pursuing agricultural careers in non-school settings were in categories that emphasized "people skills" (e.g., Business Relations, Mass Communications, Planned Change, etc.) rather than technical or scientific skills associated with competencies in such areas as the Legal or Accounting categories.
4. Some of the competencies examined in the study were not needed by students in agricultural education who were pursuing an agricultural career in a non-school setting.
5. Many of the competencies were perceived to be important or essential by several of the respondents while other respondents perceived them to be of lesser importance. Those competencies may or may not be needed by students pursuing agricultural careers in non-school settings. The representatives differed significantly in their perceptions of importance on approximately one-third of the competencies. Those competencies were classified as "might be needed."
6. Representatives of agricultural organizations or industries can identify appropriate competencies to be considered for inclusion in curricula designed for students in agricultural education who pursue agricultural careers in non-school settings.

The following conclusions were drawn relative to the second research question (Which of the competencies included in curricula for teacher education were perceived by the representatives to be needed by students in agricultural education who pursue careers in non-school settings?):

1. There were 45 competencies included in curricula for teacher education that are needed by all students in agriculture who pursue agricultural careers.
2. A few (2.5%) of the competencies included in the curricula for teacher education were not needed by students in agricultural education who pursue agricultural careers in non-school settings.
3. Some other competencies (18.8%) included in curricula for teacher education may or may not be needed by students in agricultural education who pursue agricultural careers in non-school settings depending upon their occupational goals.

In addition to the preceding, the researcher believed that the following conclusions were warranted:

1. The modified Delphi technique used in the study elicited active participation from representatives of industry and organizations.
2. Representatives of industry and/or organizations provided valuable information relative to curricula that prepare potential employees for their industry or organization.

3. An advisory council that represents the different occupational areas in agriculture (in which students in agricultural education pursue careers) can be utilized to identify and obtain the assistance of key persons in agricultural industries and organizations. Those persons could provide input relative to industry or organization expectations of potential employees.

Based on the findings of the study, a review of relevant literature, and impressions acquired by the researcher in the process of conducting the study, the following recommendations were deemed appropriate:

1. The competencies that were classified as "needed" in the study should be included in curricula for students in agricultural education who pursue agricultural careers in non-school settings.
2. The consideration of the competencies for inclusion in curricula that were classified as "might be needed" should be dependent on the results of future studies relative to those competencies and the occupational goals of the students.
3. The competencies that were classified as "not needed" should not be considered for inclusion in curricula for students in agricultural education unless further research indicates otherwise.
4. The perceptions from representatives of industries or external organizations should be sought and considered in developing curricula for students who pursue careers in those industries or organizations.
5. The Delphi technique should be considered as a viable method for obtaining industry input in the process of curriculum planning for higher education.
6. The competencies identified in this study should also be considered by other departments or programs within colleges of agriculture that are concerned with preparing students to pursue agricultural careers emphasizing "people" rather than technical or scientific skills.
7. Departments or programs of agricultural education that have students who pursue agricultural careers in non-school settings should modify their curriculum for teacher education or provide a separate curriculum for those students. There were identifiable competencies which were not included in traditional curricula for teacher education but which were needed by students pursuing agricultural careers in non-school settings.
8. The twenty-two unique competencies that were "needed" by students in agricultural education who were pursuing agricultural careers in non-school settings should be examined by teacher-educators to see if they should be included in the curriculum for teacher education.

To increase the knowledge and theory base relative to students pursuing agricultural careers in non-school settings the following recommendations for further research were made:

1. A study similar to this one should be conducted in an area of the nation in which a more urban situation exists. There were certain competencies that were rated as "not needed" (e.g., those competencies that dealt with labor laws and unions) that might be viewed differently in another state (e.g., a highly populated northeastern state).
2. Those competencies that were classified as "might be needed" should be further investigated relative to specific occupational areas.

The involvement in the study of industries and organizations that were external to higher education provided the basis for some additional recommendations:

1. While the students in agricultural education do not resemble students in other departments or programs in education, it is recommended that the methodology of this study be considered by other persons in education who are studying the problem of preparing students for entry into non-school settings.
2. It is recommended that those people concerned with increasing the interaction between industry and higher education review the methodology and results of this study.

A final observation was deemed appropriate by the investigator. While some researchers such as Crawford and Cossitt (1980) recommend bringing the respondents of a Delphi procedure together for the final phase, it is this investigator's opinion that such a process would not have been advisable for the study. This comment is based on the impressions gained by the investigator while working with the Delphi panel members. They exhibited widely varying personalities.

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DISCUSSION OF RESEARCH REPORTS PRESENTED
ON TRENDS IN AGRICULTURAL EDUCATION

NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETING
CONCURRENT SESSION E, MARDI GRAS J, NEW ORLEANS MARRIOTT
NEW ORLEANS, LOUISIANA
NOVEMBER 30, 1984

Discussants:
Edgar P. Yoder and James H. Mortensen
Associate Professors of Agricultural Education
The Pennsylvania State University

The three research reports delivered this morning have provided us with some interesting information about "Trends in Agricultural Education." It's easy for discussants to sit in their ivory tower and critique a paper. As discussants we've tried to remain mindful of the many real problems you've encountered while conducting these surveys and analyzing these data. Let us not forget that agricultural education cannot advance if these findings are not widely disseminated to the members of our profession and the public for critical examination and review. Let's get these results published!

TOPIC I: A CONTENT ANALYSIS OF THE AGRICULTURAL EDUCATION MAGAZINE 1929-1984

by
James A. Knight

Strengths

1. The author utilizes an approach we have traditionally not used. In the introduction, he provides an excellent and accurate synopsis of the technique.

2. The development of the content analysis categorization instrument was well conceived. The "heart" of a content analysis is the identification of appropriate categories.

3. The paper itself is well written and follows a systematic presentation format.

Suggestions for Improvement

1. The author describes very concisely how the categorization instrument was developed; however, when an individual examines the instrument, one raises several questions regarding the differing degree of specificity of categories for teachers, teacher educators, and supervisors. One assumes that the pilot testing with

knowledgable professionals results in a valid and usable instrument. However, the categories are structured such that inservice education of teachers does not surface as a priority of the profession. It seems to us that the categories in some cases are general and in other cases much more specific.

2. There is a mass of information presented, perhaps so much that some of the important findings and data become secondary. For example, we are not so sure that knowing one person completed 23% of all book reviews doesn't obscure the more important information a content analysis may provide--such as, what are the most important issues being debated in our writings.

3. Recommendation eleven provides a hint of perhaps the best way to analyze data for a content analysis. Dr. Knight indicates in several recommendations that trends were identified in the study, yet no such information or data are presented. It would appear that an analysis of data in a content analysis may best be accomplished by examining the content of articles within certain time frames. For example, were there differences in the types of issues discussed in the decade of the 60's vs the decade of the 70's.

4. One needs to be cautious in interpreting findings from a content analysis regarding the priorities or issues of a profession. For example, 1% of the articles have dealt with summer programs. Can we thus conclude that extended service is not a priority or issue in our profession? WRONG!

TOPIC II: ADMINISTRATORS' PERCEPTIONS OF NATIONAL ISSUES IN AGRICULTURAL EDUCATION

by

Ronald Rosati and Alan Kahler

Strengths

1. This research builds upon the previous research efforts of Dr. Dean Sutphin.

2. The researchers recognized that we must include local school personnel (principals and superintendents) in the improvement of vocational agriculture programs.

3. The investigators sought input from National Secondary School Principals Association and the Association of School Administrators in developing a pool for the samples.

4. The investigators are to be commended for not running a series of one-way ANOVA tests to determine statistical differences which would have resulted in an "exploded alpha level."

Suggestions for Improvement

1. In the write-up of the procedures section, several questions need to be answered.

    a. What was the specific criterion or criteria used to identify the people—if I were the head state supervisor of agriculture, what specific criteria (criterion) was I told to use in identifying the principals and superintendents.

    b. Potentially a total of 1500 people could be nominated, although only 875 actually were nominated. It would be helpful to know if all states were represented and what positions were represented.

    c. We are told a sample of 300 was selected, and we find that 293 principals and superintendents responded. A 97% response rate is phenomenal! Describe what you did to get that kind of response rate through a mail questionnaire.

    d. No details are provided with regard to instrument development. For the nine important national concerns, how did you develop the options? Did you use a panel of experts to try and develop content validity. Give us details so we know you have a valid and reliable instrument.

2. In the results section, you indicate several findings for which no data are presented. You report that in seven instances, the groups (principals and superintendents) displayed a different level of agreement. Table 1 does not indicate where those differences existed. What was the criterion or procedure you used to determine where those differences existed?

3. Also in the results section, we are told there were differences between the five groups. No indication is given where these differences occurred, nor the criterion used to determine if there were differences. For example, for the statement "orientation and exploration" within the issue area of purpose of agricultural education, the percentage of agreement ranged from a low of 95.4% for superintendents to a high of 100.0% for teachers, supervisors, and teacher educators. Granted, there are differences in the raw information, but is there a practical difference?

4. Perhaps the data would make more sense if they were analyzed in terms of establishing a criterion for "disagreement" and "agreement" between the groups, then let's talk about the options that fall into those two groups. You begin to do this in the conclusions section.

TOPIC III: IDENTIFICATION OF PROFESSIONAL COMPETENCIES NEEDED BY STUDENTS IN AGRICULTURAL EDUCATION PURSUING AGRICULTURAL CAREERS IN NON-SCHOOL SETTINGS

by

Thomas Curry

Strengths

1. The paper examines an area important to agricultural education, especially when we typically have 50-60% of our undergraduate agricultural education graduates finding employment in teaching. This paper addresses those 40% who find employment in non-school settings. In the past, we have only "haphazardly" considered how our curriculum addresses their needs. It seems to us that the results of this research can have a real impact as we in agricultural education departments seek new audiences for teacher education.

2. The procedures section of the paper specifically identifies two major research questions addressed by the paper, and for the most part identifies the procedures followed in a clear manner. There was some mortality in the Delphi process, and the researcher clearly indicates why the dropout existed. Also in the procedures section a rationale is developed for using the Delphi technique.

3. The conclusions developed by the investigator are based, for the most part, on data and information presented in the paper. Conclusions are presented specifically as they relate to the research questions being examined.

Suggestions for Improvement

1. It seems to us the introduction to the paper and the rationale for the study could be strengthened by indicating very early the scope or magnitude which exists regarding our graduates going into non-school settings.

2. The purpose of the study section describes three objectives; however, the procedures section really addresses two research questions. We kept looking for information related to objective one; then we discovered information related to objective one was used for the initial development work to identify the "closed responses" to be included on the questionnaire for round one of the Delphi. We would suggest objective one is really a part of the procedures section and should not be included as an objective.

3. The selection of the Delphi "panel of experts" was made by the Advisory Committee for the Undergraduate General Agriculture program at Texas A&M. It would be helpful to have some background on the total pool from which the 23 panel members were selected. We get some indication of that in Table 1, but the information is rather general. For example, we know that 40% of the panel (9 of 23) came

from a category called "other agricultural service." What is "other agricultural service"? What is "agribusiness"? Is this panel of experts a sample from a larger group of people employing 1983 agricultural education graduates in non-school settings, or are these 23 people a census? Additionally, what criteria (criterion) were (was) used by the Advisory Committee in selecting the "panel of experts"?

4. You indicate in the procedures section that in the second round of the Delphi you included "open responses" developed in round one "along with a summary of how the panel rated the competencies." How did they they rate the competencies? Nowhere in the paper are we told what scale was used on the instrument. Did you have them respond to a Likert-type scale or nominal categories? Information in the table headings (Tables 2-4) leads us to believe you used nominal categories, but we're not really sure. In the procedures section, give us an operational definition of the scale of measurement.

5. With regard to the recommendations, why not be more specific? For example, in recommendation seven, rather than indicate we should modify our agricultural education curriculum, why not indicate what the specific modifications should be?

THEME: VOCATIONAL AGRICULTURE PROGRAMS

PROBLEMS ENCOUNTERED BY BEGINNING VOCATIONAL AGRICULTURE TEACHERS IN LOUISIANA

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PROBLEMS ENCOUNTERED BY BEGINNING VOCATIONAL AGRICULTURE TEACHERS IN LOUISIANA

INTRODUCTION

Every year new teachers step into the classroom with anxiety, wondering what their first year of teaching will be like. During the school year these teachers will discover areas they were not completely prepared for, and in most cases they will locate some problems areas.

This does not necessarily mean that the teacher education program did not do a good job. It is common for beginning teachers to face and attempt to cope with and solve various types of problems. Since vocational agriculture teachers are involved in not only classroom teaching, but also in conducting a total program, there are certainly many areas that could be labeled as potential problem areas. Vocational agriculture teachers are classroom teachers, laboratory and shop teachers, and FFA advisors.

Bugler (1976), reported in his study that 12 to 14 percent of the entering vocational agriculture teachers left the profession after each of the first two years of teaching. According to a study by Morgan (1978), the percentage of agricultural education personnel remaining in the profession after entering decreased from 84 percent one year after entering to 43 percent remaining six years after entering. A 10.9 percent, above average, turnover rate contributed to the teacher shortage existing in vocational agriculture in 1982 (Craig, 1983).

A questionnaire surveying 89 first-year teachers of vocational agriculture in Ohio was used by Malek in 1978. This study revealed that the competency area of "Student FFA Organization" was the area in which first-year teachers needed the most professional assistance.

Farrington, in 1980, conducted a study to determine problem areas encountered by first and second year vocational agriculture teachers in the southern region of the United States. Problems identified included:

1. A high number of students with low academic ability,

2. Adapting instruction for students with low academic ability,

3. Motivating students and keeping them interested, and

4. Coordinating the activities of an active young farmer organization.

A study conducted by Webb, Stoner and Vaclarik (1977) sought to determine problem areas encountered by first-year vocational agriculture teachers in the state of Texas. A questionnaire listing potential problem areas was mailed to all first-year vocational agriculture teachers in the state. They were asked to rate the problem areas on a 1-5 scale (none-to-great problem).

Problem areas rated highest were:

1. Teaching record books,

2. Obtaining supplies and equipment, and

3. Working with young farmers and adult groups.

First year vocational teachers in Florida secondary public schools were surveyed concerning their problems and areas of needed assistance (Riley, 1979). In this study, teachers identified the following areas of greatest need:

1. Working with slow learners,

2. Establishing and enforcing rules of conduct, and

3. Maintaining classroom safety when working with laboratory equipment.

There is a need to identify problems experienced by beginning vocational agriculture teachers. By identifying these problems and looking at potential solutions, perhaps some helpful methods for overcoming these problems will be found. This may also lead to graduate classes, in-service workshops, supervision or guidance which will assist the beginning teacher when problems arise. Hopefully, information obtained by this study, if applied, will allow beginning vocational agriculture teachers to recognize and cope with problem situations, and in the long run, show some possible means of reducing the teacher turnover rate.

PURPOSE AND OBJECTIVES

The purpose of the study was to determine the perceptions of beginning vocational agriculture teachers in the state of Louisiana regarding problems they have encountered during their first or second year of teaching. This study also sought to identify potential strategies for alleviating these problems.

The specific objectives of this study were:

1. To describe beginning vocational agriculture teachers (first and second year teachers) on selected demographic variables.

2. To identify problem areas and determine the extent to which various situations in the field of teaching vocational agriculture present a problem for beginning teachers.

3. To identify possible strategies for alleviating the problem situations.

PROCEDURES

The descriptive method of research using a closed form opinionnaire was used to gather data for this study.

Instrumentation

Instrumentation for the study involved a researcher designed questionnaire. The initial items were developed after a review of the related literature. This review lead to the identification of three instruments used in related studies. However, none of these instruments were judged to be completely appropriate for the objectives of this study. Therefore, using portions of these instruments and other information derived from the review of literature, the researchers developed their questionnaire.

The preliminary instrument was then validated through a review by selected vocational agriculture teachers and teacher educators in Louisiana. Revisions were then made based on the input from these groups of reviewers, and the final instrument was prepared and distributed by mail to the selected sample.

The questionnaire in the study consisted of four parts which were designed to accomplish the following purposes: (1) Part I of the instrument was designed to collect descriptive data regarding the characteristics of the beginning vocational agriculture teacher. (2) Part II consisted of a list of 33 potential problem situations. Teachers were asked from their experience to rate each problem situation on a five point Likert-type scale ranging from 0 = No Problem to 4 = Extreme or Very Serious Problem. (3) Part III of the instrument included fifteen areas where help might be provided to teachers in their early years of teaching. Respondents were asked to rank those five areas which they felt were needed most. They were to rank the items from 1 to 5 with 1 being the area most needed. (4) Part IV identified possible methods of providing information to beginning teachers. Eight possible methods were listed, and respondents were requested to rank the four most desirable methods from 1 to 4 with 1 being the most desirable.

Parts II, III, and IV of the questionnaire also allocated space for comments and additional suggestions and input.

Data Sources

The population for this study consisted of beginning vocational agriculture teachers in Louisiana. Beginning teachers were defined for purposes of this study as those who were in their first or second year of teaching. The population was identified with the assistance of the Vocational Agriculture Section of the Louisiana Department of Education. The total defined population consisted of 13 beginning vocational agriculture teachers; therefore, a census of the population was conducted.

Data Collection

After the initial instrument was developed, it was validated through a review by selected vocational agriculture teachers and teacher educators. Appropriate changes were made and the final instrument was prepared and distributed to the defined population.

The first mailing of the questionnaire resulted in 10 of the 13 teachers responding for a 76.9% response rate. Non-response follow-up procedures utilized in this study included a follow-up letter and second copy of the questionnaire; a telephone call; and finally a personal visit to collect one questionnaire that had still not been returned. The final response rate in the study was 100 percent.

RESULTS

Objective one of the study was to describe beginning vocational agriculture teachers on selected demographic variables. Means were determined for the characteristics of the beginning teachers. The highest academic degree completed by all of the respondents was a bachelor's degree. It was determined that the average number of classes being taught by beginning vocational agriculture teachers in Louisiana was 5.1 with a range of from four to six classes.

The total student enrollment in classes taught by the respondents ranged from a low of 12 students to a maximum of 130 students with an average total enrollment of 86. The average age of the beginning teachers was 24.5 years.

Eleven (85%) of the respondents were fully certified to teach vocational agriculture. The other teachers (two or 15%) were hired on a temporary certificate. Regarding their undergraduate college major, nine or 69 percent of the teachers were in agricultural education, two or 15 percent were in a technical agriculture curriculum, and two had undergraduate degrees in both agricultural education and a technical agriculture field.

When asked about their enrollment in high school vocational agriculture, 11 (85%) indicated that they had taken vo-ag and two (15%) responded negatively. Of those who had taken high school vo-ag, six were enrolled for four years, and five were enrolled for two or three years. In addition, all of the beginning teachers who were enrolled in high school vocational agriculture were also in the Future Farmers of America each year that they were in vo-ag.

Respondents were also asked whether or not they were required to teach courses other than vocational agriculture. Two indicated that they were required to teach other classes with one person teaching one other class, and one teaching two other classes.

The second objective was to identify problem areas and determine the degree to which certain situations presented a problem to beginning teachers. Part II of the questionnaire was used to determine this information. Means and standard deviations were calculated for each of the items.

Table 1 presents the mean, standard deviation and rank of the 33 identified potential problem situations for vocational agriculture teachers. The item identified by beginning teachers as the most serious problem was "High number of students with low academic ability" (mean = 2.62). Other items receiving a mean rating of 2.0 or higher on the 0 to 4 scale included: "Motivating students and keeping them interested" (mean = 2.39); "Students in class who should not be in vocational agriculture" (mean = 2.25); and "Adapting instruction for students with low academic ability" (mean = 2.15).

Potential problem situations which were perceived to be least serious to beginning teachers included: "Evaluating students (tests and grades)" (mean = .42); "Your knowledge and skill in agriculture/agribusiness" (mean = .39); "Developing good community relations" (mean = .39); and "Developing good school relations (teachers, students, administration, etc.)" (mean = .15).

Objective three of the study was to identify possible strategies for alleviating the problem situations. This involved two steps. First, identifying the topics which would be most beneficial to beginning teachers, and second, determining the teachers' perceptions as to how they preferred information on these topics to be delivered to them.

Part III of the questionnaire was used to collect data concerning needed topics. Respondents were asked to rank the five most needed topics from 1 to 5. These findings are presented in Table 2. Topics which were ranked as most desirable (lowest mean rank) included: "Handling discipline problems" (mean rank = 3.31); "Advising and coordinating the FFA chapter" (mean rank = 3.46); "Time management" (mean rank = 3.77); "Teaching students with low academic ability" (mean rank = 4.46); and "Development and visitation of SOE programs" (mean rank = 4.46).

Topics receiving the highest mean ranks (least desirable) included those which were identified in the top five by no more than one of the 13 respondents. These items were: "Completing FFA applications for awards" (mean rank = 5.77); "Evaluating students (tests and grades)" (mean rank = 5.85); "Planning and delivering young farmer and adult programs" (mean rank = 5.92); and "Developing good school and community relations (students, parents, teachers, etc.)" (mean rank = 6.00 - not ranked by any respondents).

To determine the teachers perceptions as to how they preferred information on needed topics to be delivered to them, the respondents were asked to rank from 1 to 4 the most desirable methods presented in part 4 of the questionnaire. These data, presented in Table 3, reveal that the delivery method ranked as most desirable (lowest mean rank) by beginning teachers was "Advice from experienced teachers" (mean rank = 2.46). Other items ranked high included: "Workshops" (mean rank = 2.54); "Local inservice programs" (mean rank = 2.62); and "Short courses" (mean rank = 3.77).

Table 1

Beginning Vocational Agriculture Teachers' Perceptions of Potential Problem Situations

Item Number	Teaching Situation	Mean[a]	Standard Deviation	Rank
4.	High number of students with low academic ability	2.62	1.12	1
3.	Motivating students and keeping them interested	2.39	.96	2
33.	Students in class who should not be in vocational agriculture	2.25	1.42	3
5.	Adapting instruction for students with low academic ability	2.15	.99	4
9.	Helping students develop supervised projects	1.92	1.38	5
32.	Inadequate salary	1.77	1.42	6
2.	Organizing and maintaining an advisory committee	1.75	1.36	7
7.	Handling discipline problems	1.69	.95	8
23.	Teaching record keeping	1.55	.69	9
6.	Obtaining equipment, supplies, etc.	1.54	1.05	10
14.	Financing F.F.A. chapter	1.50	1.00	11
26.	Spouse's understanding of the responsibilities of a vocational agriculture teacher	1.50	1.92	12
17.	Keeping an inventory of supplies and equipment	1.42	.52	13
24.	Planning and delivering young farmer and adult programs	1.38	1.30	14
13.	Determining what to teach and when to teach	1.31	1.11	15
21.	Developing skills to prepare judging teams	1.27	.91	16

Table 1 (continued)

Item Number	Teaching Situation	Mean[a]	Standard Deviation	Rank
31.	Long hours	1.23	.83	17
19.	Completing F.F.A. applications for awards	1.20	.92	18
10.	Scheduling home visitations and supervision of occupational experience programs	1.17	1.12	19
1.	Planning time to prepare for class and lab	1.15	.99	20
18.	Developing a filing system	1.08	.95	21
25.	Presenting classroom lessons	.92	.64	22
28.	Extra school duties, such as lunch duty, bus duty, hall duty, etc.	.92	.95	23
29.	Inadequate administrative support and backing on decisions	.92	1.38	24
8.	Providing for the safety of students	.85	.90	25
27.	Inadequate travel budget	.85	.99	26
22.	Advising the FFA chapter	.75	.87	27
30.	Negative attitude of other teachers	.62	.87	28
16.	Obtaining teaching aids and materials	.54	.78	29
15.	Evaluating students (tests and grades)	.42	.67	30
20.	Knowledge and skill in agriculture/agribusiness	.39	.51	31
12.	Developing good community relations	.39	.65	32
11.	Developing good school relations (teachers, students, administration, etc.)	.15	.38	33

[a] Means based on a 0 to 4 response scale

Table 2

Beginning Vocational Agriculture Teachers' Perceptions of Needed In-Service Topics

Item Number	Topic	N[a]	Mean Rank[b]	Rank
4.	Handling discipline problems	8	3.31	1
1.	Advising and coordinating the FFA chapter	10	3.46	2
9.	Time management	7	3.77	3
3.	Teaching students with low academic ability	6	4.46	4.5
11.	Development and visitation of SOE programs	6	4.46	4.5
13.	Determining what to teach and when to teach it	6	4.85	6
8.	Teaching record keeping	5	5.08	7
10.	Obtaining equipment, teaching supplies, etc.	4	5.08	8
14.	Keeping an inventory of supplies and equipment	4	5.31	9
2.	Organizing and maintaining an advisory committee	3	5.54	10
12.	Developing a filing system	2	5.77	11
15.	Completing FFA applications for awards	1	5.77	12
6.	Evaluating students (tests and grades)	1	5.85	13
7.	Planning and delivering young farmer and adult programs	1	5.92	14
5.	Developing good school and community relations (students, parents, teachers, etc.)	0	6.00	15

[a] Number of respondents who ranked the item among the five most needed.

[b] The mean rank was calculated as a simple average of ranks assigned to items. If an item was not ranked among the top five, it was assigned a value of 6; therefore, each mean was calculated with an N of 13.

Methods which received the lowest mean ranks were those dealing primarily with supervision. These items included: "Supervision by university personnel (mean rank = 4.77); "Supervision by parish or state supervisors" (mean rank = 4.85); and "Supervision by local administrator (principal)" (mean rank = 4.92).

Table 3

Beginning Vocational Agriculture Teachers' Perceptions of Desired Methods of Providing Information on Needed Topics

Methods of Providing Information		N[a]	Mean	Rank
8.	Advice from experienced teachers	10	2.46	1
3.	Workshops	13	2.54	2
2.	Local inservice programs	9	2.62	3
4.	Short courses	7	3.77	4
1.	Graduate classes	6	4.23	5
7.	Supervision by university personnel	2	4.77	6
6.	Supervision by parish or state supervisors	2	4.85	7
5.	Supervision by local administrator (principal)	1	4.92	8

[a] Number of respondents who ranked the item among the four most desirable.

[b] The mean rank was calculated as a simple average of ranks assigned to items. If an item was not ranked among the top four, it was assigned a value of 5; therefore, each mean was calculated with an N of 13.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

From analysis of data collected in this research study, the following conclusions were drawn:

1. Overall, the beginning vocational agriculture teachers do not consider most teaching situations to be serious problems. No item was rated higher than 3.0 on the 0 to 4 scale.

2. A need exists for courses or other methods of providing information about dealing with problem situations to be offered to vocational agriculture teachers in their early years of teaching.

3. A need exists for the beginning teachers to be better prepared to teach students with low academic ability, handle discipline problems, motivate students, and effectively master a time management system.

Recommendations

Upon the completion of this study the following recommendations were made:

1. The State Department of Education should implement local inservice programs, workshops and short courses dealing with the major problem situations encountered by the beginning vocational agriculture teachers.

2. Some type of "buddy system" or method to receive advice from experienced teachers should be organized for the beginning vocational agriculture teachers.

3. A course, perhaps undergraduate for those college students in vocational agriculture, or graduate course, workshop or inservice program should be offered which addresses the topic of special needs students in the vocational agriculture classroom. The major problems identified in the study were related to students with low academic ability.

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SUMMER PROGRAMS OF VOCATIONAL AGRICULTURE IN THE UNITED STATES

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INTRODUCTION

The summer months of the vocational agriculture teacher have legislatively and traditionally been months of supervision, teaching and learning. Since the passage of the Smith-Hughes Act in 1917, vocational agriculture teachers have been employed for a longer period of time than other teachers in the high school (originally 12 months) for the purpose of conducting summer programs.

Summer programs are a valuable and necessary component of the Vocational Agriculture program in the United States. The teaching of students of vocational agriculture can not and should not stop at the end of May if we intend to gain the optimum advantages in learning for our students.

Instruction must continue in areas that can not be adequately covered during the school year due to the seasonality of agriculture. These areas include crop and animal diseases, fertilization, harvesting procedures, grain elevator operation, cotton gin operation, and irrigation to name just a few. In addition, cooperative agricultural education programs are in full operation during the summer and these students need supervision.

The teachers of today are asked to do much more than supervise on farm SOE programs during the summer. Larger numbers of students, advisory councils, more contests, new reporting forms and numerous other requirements make it difficult to perform all the duties of the vocational agriculture teacher of 1984. This study was an effort to determine what the teachers believe they should do and what they actually are doing. These findings will provide a basis with which teachers and supervisors can examine their summer programs of vocational agriculture and determine what is reasonable to include in summer programs in the future.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine the summer activities in the program of vocational agriculture that should be and are being conducted by vocational agriculture teachers in the U.S. The objectives for the study were:

1. Gather demographic information concerning vocational agriculture teachers and programs in the United States.

2. Identify the activities that vocational agriculture teachers believe should be a part of all summer programs in vocational agriculture and the percentage of time that should be spent on these activities.

3. Identify the activities that vocational agriculture teachers actually participated in during the summer of 1983 and the amount of time expended on each activity.

4. Compare the time that vocational agriculture teachers felt should be spent (objective 2) with the time that was actually spent on the identified activities during the summer of 1983 (objective 3).

PROCEDURES

Phase I

A two page questionnaire was mailed to all 50 state directors of vocational agriculture programs. Information solicited about each state included: types and numbers of secondary programs, number of teachers, method for determining and length of teachers contract, and types of summer activities held at the state level. All 50 state directors returned their surveys after one initial mail-out and one phone follow-up.

Next, the 12496 persons in the population of vocational agriculture teachers in the United States (Miller, 1983) were the basis for a returned sample size of 173 using Cochran's sample size formula. Since the researchers anticipated that as few as 40-50% of the teachers in the sample would agree to take the considerable time necessary to participate in the study, a random sample of 400 was selected to insure that the minimum of 173 was secured. Using the Agriculture Teachers Directory, 1982 edition, as the source of names and addresses, a systematic random sample of 400 was chosen (every 31st name).

A personalized letter asking for help with the study along with a personalized return postcard was mailed to the sample in early March. A second personalized letter and personalized return postcard was mailed to non-respondents followed by a phone follow-up of non-respondents.

Of 400 requests for help with the summer long project, 227 (57.2%) agreed to help, 4 (1.0%) were returned as undeliverable, 122 were unable to help for various reasons and 47 could not be contacted after three efforts by phone and mail.

In late March, a draft of the "first" questionnaire designed to obtain program and teacher descriptions and to identify activities that should be a part of all summer programs was mailed to ten vocational agriculture teachers (not in the sample of 397) selected at random from the population for validation purposes. Their completed questionnaires were reviewed and modifications were made to the questionnaire prior to the mid-April mailing of the questionnaire to the sample (those who had agreed to help with the study). One additional letter and one postcard were mailed to non-respondents as reminders of their agreement to participate.

Phase II

In mid-May, seven bi-weekly summary sheets (containing the same activities as the above questionnaire (the summary sheets represent a "second" questionnaire") with a letter of instructions and seven return envelopes were mailed to all teachers who had agreed to help with the study.

Two letters that included a telephone number for a collect call to the researchers were mailed as follow-up reminders to those failing to return the second questionnaire. A telephone call was made to those who had failed to respond by summers end and they were asked to summarize their entire summer on one sheet only (instead of six or seven). The one sheet summaries were compared to those with multiple sheets to determine if any differences existed. No differences were detected.

A total of 209 teachers (or 52.3% of the 400 in the sample) returned both the initial questionnaire and the seven summary sheets. The data were analyzed (based on percentages of time expended) using descriptive statisticsd (means and frequencies) and the student-T test.

RESULTS

State Supervisor's Responses

The state supervisors reported having the types and numbers of programs shown in Table 1. Vocational agriculture teacher contract lengths reported by the supervisors are shown in Table 2.

TABLE 1

TYPES OF VOCATIONAL AGRICULTURE PROGRAMS AS REPORTED BY STATE SUPERVISORS

PROGRAM TYPE	NO. OF PROGRAMS
Agricultural Production	6411
Agri-business	431
Floriculture	130
Landscape Horticulture	279
Combined Floriculture/Horticulture	862
Agricultural Mechanics	604
Food/Meat Processing	32
Natural Resources/Forestry	351
Animal Care	79
Farm Management	37
Turf Grass/Grounds Maintenance	49
General Agriculture	48
Fisheries	1
Exploratory Agriculture	208
Special Needs	159
Rural Recreation	20
Fundamentals of Agricultural Occupations	163
Applied Principles of Agricultural Occupations	116
Building Construction	20

TABLE 2

TEACHER'S CONTRACT LENGTHS

CONTRACT LENGTH	NO. OF STATES
Mandatory 12 months	9
Mandatory 11 1/2 months	1
Mandatory 11 months	2
Mandatory 10 1/2 months	1
9 months	2
Length determined at local level	25
Length depends on type of ag. program	7
1 day allotted over 9 months for each student with SOEP	1
12 months for single teacher departments and 11 months for multiple teacher departments	1
All 11 or 12 month contracts	1
TOTAL	50

The number of states in which supervisors reported that teachers conducted selected activities as a part of the summer program are reported in Table 3. The summer activity reported most often was a state teachers' conference.

TABLE 3

TEACHER'S SUMMER ACTIVITIES

ACTIVITY	NO. OF STATES
State FFA Convention	26
State Vocational Agriculture Teachers Conference	43
FFA/Leadership Camp	31
Fairs/Shows	34
Teacher Technical Up-dates	44

Teacher's Responses

Over two-thirds of the respondents were between the ages of 26 and 45 as shown by the data in Table 4. The sample contained eight females and 196 males. Six did not indicate their sex.

TABLE 4

TEACHERS' AGES

Age Range (n=209)	Frequency	Percent
20-25	14	6.7
26-30	53	25.2
31-35	49	23.3
36-40	28	13.6
41-45	20	9.5
46-50	18	8.6
51-55	7	3.3
56-60	13	6.2
61-65	7	3.3
66+	1	.5

Forty-nine percent indicated their highest degree was the bachelor of science while 47.6% indicated the masters degree. Forty-seven percent reported that they engaged in other employment to supplement their income. The teachers gave the responses displayed in Table 5 when asked about the length of their contracts. As the data indicate, almost two-thirds were on twelve month contracts.

TABLE 5

LENGTH OF CONTRACT

LENGTH (n=209)	FREQUENCY	PERCENT
12 months	137	65.2
11 1/2 months	9	4.3
11 months	32	15.2
10 1/2 months	5	2.4
10 months	22	10.5
9 1/2 months	2	1.0
9 months	2	1.0

The mean number of years of total teaching experience was 12.7 with a standard deviation of 10.1 and the mean number of years of teaching experience in the state where they were at the time of the study was 12.5 with a standard deviation of 9.9. The mean number of years teaching at their present position was 10.6 with a standard deviation of 10.3.

The number of teachers in the respondents' vo-ag department ranged from one to twelve with a mean of 1.9 and a standard deviation of 1.4. The most numerous facilities in use were agricultural mechanics laboratories (utilized by 68.4%) and greenhouses (utilized by 38.3%) (Table 6).

TABLE 6

PROGRAM FACILITIES

Facility (n=209)	Frequency	Percent
School crop farm	55	26.3
School livestock facility	45	21.5
Greenhouse	80	38.3
Nursery	43	20.6
Garden (vegetable/flower)	42	20.1
Food processing (meat/ produce)	13	6.2
Small animal care lab.	5	2.4
School forest	44	21.2
Mechanics laboratory	143	68.4

Student grade levels reported by the teachers are shown in Table 7. The mean number of day (junior or senior high school) students was 68.9 with a standard deviation of 48.0. The mean number of adult students as reported by 89 teachers was 28.3 with a standard deviation of 28.3.

TABLE 7

GRADES TAUGHT

Grade (n=209)	Frequency	Percent
Grade 7	14	6.7
Grade 8	21	10.0
Grade 9	155	73.8
Grade 10	185	88.1
Grade 11	195	92.3
Grade 12	193	91.9
Young adults	73	34.8
Adults	92	42.9

When teachers were asked what they should spend their time on, teachers assigned the largest block of time during the summer to visiting students with SOE programs (20%) and operating a school farm/greenhouse or other instructional laboratory (7.8%). When asked what they actually did during the summer, teachers reported that they spent the largest block of time visiting student SOE programs (16.2% of their time) and university summer school (11.6%).

There were significant differences on 20 activities (at the .05 level) between what the teachers said should be done and what they said they actually did during the summer of 1983. Only the data from those teachers who said they should perform an activity were used in the comparisons.

Teachers spent significantly more time than they said they should on the following activities: shows, fairs and sales; meetings with administrators; paperwork; state FFA convention; operating the school farm, greenhouse or other instructional laboratory; performing school maintenance; vacation; attending summer teachers conference; and advising 4-H clubs.

Teachers spent significantly less time than they indicated they should on the following activities: field days and/or trips without students; visiting students with SOE programs; visiting cooperative program students; visiting incoming freshmen; recruiting new students; arranging for student employment sites; collecting samples for classroom study; meeting with advisory committee; FFA chapter meetings; and FFA chapter recreation and socials.

TABLE 8

SUMMER EMPLOYMENT ACTIVITIES THAT SHOULD BE AND WERE PERFORMED

	Should Be Performed		Were Performed			
Activity	Frequency	% Summer	Frequency	% Summer	t-value	Probability
Shows, fairs and/or sales	144	6.0	102	11.2	- 2.07	.0403*
Contests	99	4.0	60	6.1	- .05	.9587
Field days/trips with students	108	3.6	77	5.6	.69	.4919
Field days/trips without students	95	3.4	67	3.1	2.84	.0051**
Visit students with S.O.E.P.'s	168	23.3	163	16.2	5.29	.0001**
Visit co-op work program students at the job site	96	6.6	58	4.3	5.6	.0001**
Visit adult students	82	5.8	91	4.2	1.54	.1249
Visit incoming freshmen	134	4.9	76	3.3	4.45	.0001**
Follow-up former students	108	2.7	87	2.3	2.50	.0135*
Recruit new students	90	2.9	47	1.6	5.27	.0001**
Arrange student employment sites	80	3.1	41	3.1	2.49	.0137*
Organized/scheduled meetings with administrators	95	1.9	101	2.3	- 1.48	.1398
Paperwork (reports/records)	169	3.7	172	6.9	- 5.36	.0001**
Inventory vo-ag facilities	136	2.8	116	4.0	- 0.97	.3328
Order supplies and equipment	145	2.8	137	3.7	- 1.72	.0867
Collect samples for classroom study	91	2.9	59	2.1	4.68	.0001**
Up-date curriculum/lesson plans	157	5.3	131	5.0	1.55	.1241
Meet with advisory council	113	1.7	47	1.3	6.67	.0001**
FFA chapter meetings	147	2.3	97	1.7	6.52	.0001**
FFA leadership camp	120	4.2	62	8.0	.35	.7271
FFA chapter recreation/socials	87	2.0	34	2.9	3.12	.0021**
FFA state convention	120	4.6	95	9.6	- 3.15	.0019**
FFA alumni meetings	28	1.5	15	1.4	1.60	.1121
Conduct adult classes/meetings	40	3.2	33	6.4	- 0.93	.3525
Public relations	129	3.3	105	3.3	1.01	.3144

Note: The "frequency" column includes those teachers who indicated that this activity was or should be performed. The "% summer" column indicates the percent of the summer that teachers reported should be or was spent on this activity.

TABLE 8 (continued)

SUMMER EMPLOYMENT ACTIVITIES THAT SHOULD BE AND WERE PERFORMED

	Should Be Performed		Were Performed			
Activity	Frequency	% Summer	Frequency	% Summer	t-value	Probability
Community service	99	3.4	91	6.1	- 1.57	.1189
Operate school farm/greenhouse/ or other instructional lab.	96	7.8	109	10.8	- 3.20	.0016**
Open vo-ag facilities to community	59	3.6	55	4.8	- 0.89	.3729
Perform school maintenance (non vo-ag)	24	4.7	66	3.2	- 2.07	.0397*
Maintain vo-ag equipment/ facilities	149	5.8	149	6.8	- 1.37	.1717
Vacation (personal)	130	11.6	141	16.1	- 3.17	.0003**
University summer school	54	4.0	23	11.6	- 0.68	.4950
Attend non-credit workshops	35	2.7	75	6.6	- 0.82	.4142
Attend regional NVATA meeting	35	2.7	11	8.5	0.49	.6231
State teacher's conference	156	4.3	108	8.0	- 2.21	.0285*
Washington leadership conference	16	7.1	8	3.8	1.10	.2742
Advise 4-H club	17	1.5	31	2.0	- 2.99	.0032**
Other	17	4.2	75	4.9	- 4.53	.0001**

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Significant differences existed between what teachers thought they should do during the summer and what they actually did. In addition, teachers reported several activities such as general school maintenance that may not contribute to the vocational agriculture program.

Recommendations

1. Teachers should continue to allocate a major portion of their summer to student contact and, where possible, redirect time currently being spent in non-student contact activities to student contact activities. This time should include SOEP supervision, group and individual instruction, continuity of FFA chapter activities (both leadership and social), and visits with new and prospective students.

2. Time spent by the vocational agriculture teacher on paper work, departmental maintenance and other non-student contact activities should be minimized. Examples of ways to minimize the non-student contact time include: 1. Have students (juniors and seniors) take inventory and perform equipment and shop maintenance prior to year end; and 2. Use time management techniques. For example, efficient management of paper work (handle it only once instead of delaying it) will save time.

3. The teacher should endeavor to spend time with all students during the summer, not only officers or those having large SOE programs. The other students may need even more help than the examples cited.

4. Teachers should develop a daily plan for the summer and share it with their principal before the end of the school year. Each week, an updated plan for the coming week should be posted on the vocational agriculture classroom/shop door. This plan should include a schedule of the teachers in-school and out of school time allocations.

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PERCEIVED COMMUNICATIONS AND SUPPORT LINKAGES OF HIGH SCHOOL PRINCIPALS AND VOCATIONAL AGRICULTURE TEACHERS

by

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PERCEIVED COMMUNICATIONS AND SUPPORT LINKAGES OF HIGH SCHOOL PRINCIPALS AND VOCATIONAL AGRICULTURE TEACHERS

INTRODUCTION

According to Finch and McGough (1982) the only way an organization can be successful is through communication. In the case of educational organizations, the actions of administrators, faculty, and staff must pass through various communications channels. Barriers are inevitably being erected to impede communication. The results are misunderstanding, insecurity, conflict and/or lack of motivation. According to Davis (1982), if barriers are substantially removed, people not only can but will work together.

Miles (1965) in analyzing healthy organizations states that in a healthy organization, there is relatively distortion-free communication vertically and horizontally. People have the information they need and have gotten it without exerting undue efforts....(pp. 18).

Lucio & McNeil (1979) found that...teachers whose wants and needs are in agreement with their principal's expectations express significantly higher job satisfaction than teachers whose wants are in conflict with the principal's definition of the teacher's role. There is often wide disparity between what the principal says is expected of teachers and what the teachers think the principal expects of them (pp. 30).

Studies conducted by Argyris (1962) suggest that sound decision making depends on informal interpersonal relationships (more than on formal structure) based on the following factors: genuineness, descriptive nonevaluative feedback, sensitivity, and rationality.

Declining enrollments, advancing technology, updating curriculum, changing student needs and a demanding school community all contribute to establishing barriers to communication because there are various viewpoints to be considered. How do schools currently support vocational agriculture programs and foster communiction linkages? Whose responsibility is it to take the initiative for establishing communicatons linkages? How do school administrators and vocational agriculture teachers communicate?

PURPOSE AND OBJECTIVES

The main purpose of this study was to determine the extent of the perceived communication linkages between school principals and vocational agriculture teachers. The specific objectives of the study were as follows:

1. To compare perceptions concerning communications and program support between high school principals and vocational agriculture teachers.

2. To identify the current status of contractual support for vocational agriculture activities.

3. To identify the extent of informal and formal supervisory contact time between high school principals and vocational agriculture teachers.

PROCEDURES

The descriptive method of research using a questionnaire with a Likert-type scale was used to gather data for this study. The questionnaire was developed by the researcher based on a review of the literature. The instrument was validated through a review by selected vocational agriculture teachers. Revisions were made based on the review and the final instrument was prepared for distribution.

The survey form consisted of 30 questions. The instrument was mailed to all vocational agriculture teachers (256) and their respective high school administrators (227) in the state of Indiana during the summer of 1983. After three weeks, follow-up letters were sent and telephone calls were made to 10 percent of those not responding, to note any differences in the groups - non-respondents to respondents. There were no unusual characteristics about the non-respondents. There was an overall 77 percent response rate.

Respondents were asked to complete 23 questions regarding their perceptions of the communication linkages in their schools using a five point Likert-scale. The scale consisted of numerical values as follows: 1-none; 2-very little; 3-some; 4-considerable; 5-very great. Respondents were also asked to complete seven questions, in a multiple choice format, regarding contractual and supervisory matters in their schools. The Cronbach-alpha reliability for the survey instrument was calculated to be (0.91). The data were analyzed using means, standard deviations, t-tests, and frequencies.

FINDINGS

Interest in Vocational Agriculture

Table 1 indicates that there was not a significant difference at the .05 level in the perceptions of principals and teachers regarding community support for vocational agriculture. However, there were differences in perceptions of principals and teachers regarding the interest in the vocational agriculture program on the part of the students, the principal and the teacher. Principals indicated that they support the vocational agriculture program but the teachers do not feel the principals take as much interest in vocational agriculture as they indicate. Principals indicated that students are not as interested as teachers think they are. Principals looked forward to their day more than did teachers.

Openness and Receptiveness

Table 2 indicates that there were significant differences at the .05 level in the perceptions of principals and teachers regarding all four items on this subscale - principal-teacher talk, student-teacher talk, friendliness and support, and approachability. Principals generally indicated that it was their perception that there was more one-to-one communication than did teachers, however, teachers indicated more one-to-one communication on the part of teachers and students regarding school matters.

Team Work

Table 3 indicates there were significant differences at the .05 level in the perceptions of principals and teachers regarding team building in their schools. Overall, principals perceive there is more confidence building and team work occurring in their schools than was indicated by teachers of vocational agriculture.

Problem-Solving

Table 4 indicates that there was not a significant difference at the .05 level in the perceptions of principals and teachers of vocational agriculture regarding the principal's thoroughness in explaining school procedures. However, the principals perceive helpfulness provided among teachers and candid and useful information provided by the administration to teachers to be greater than what vocational agriculture teachers perceive it to be.

Program Development

Table 5 indicates that there was no significant difference at the .05 level in the perceptions of principals and vocational agriculture teachers regarding the use of community resources. However, there were significant differences between the respondent groups regarding the usefulness of information, teacher independence, and discussions regarding program goals and objectives, FFA programs, and supervised occupational experience programs. The teachers apparently perceive that they have more independence than principals believe they have.

Contractual Arrangements and Supervisory Practices

The findings concerning the general contractual arrangements and supervisory practices in respondent's schools yielded the following information:

1. Over 52 percent of the respondents held 12 month contracts.
2. Nearly 8 percent of the respondents held 9 month contracts.
3. Over 18 percent of the respondents did not conduct an advisory committee meeting during the 1982-83 school year.
4. Nearly 18 percent of the respondents conducted less than 10 supervised occupational on-site instructional meetings during the 1982-83 year.
5. Over 7 percent of the respondents did not conduct supervised occupational programs in 1982-83 school year. Teachers indicated their estimates of the number of supervised occupational visits to be higher than estimated by the principals.
6. Nearly 50 percent of the respondents reported having from 6 to 10 faculty meetings in 1982-83.
7. Over 35 percent of the respondents indicated having over 16 parental visits to the vocational agriculture department.
8. Nearly 5 percent of the respondents had no visits to the vocational agriculture departments by parents.
9. Over 12 percent of the respondents indicated not having any school administrative supervisory conference in the 1982-83 school year.
10. Thirty-five percent of the respondents had one supervisory conference.
11. Over ten percent of the respondents indicated not having any formal observation of instruction involving the principal or his/her designee.
12. Nearly 35 percent of the respondents had one formal observation of instruction by the principal or his/her designee.

CONCLUSIONS

There were no statistically significant differences (at the .05 level) between the perceptions of principals and teachers regarding the following items: community support for the school and the vocational agriculture program, the use of community resources, explanation of formal plans, the number of formal plans and procedures.

However, there were statistically significant differences (at the .05 level) in the perceptions of principals and teachers of the following items: teacher enthusiasm for the program, student interest, free exchange of information, student feedback, confidence in each other, confidence in other teachers, friendliness and support of each other, assistance with professional problems, team work, discussion of FFA, and SOE activities, and accountability of time and resources.

High school principals in this study indicated that they lacked information regarding the scheduled on-site instruction through the supervised occupation experience program. An alarming number of vocational agriculture teachers in this study do not conduct advisory committee meetings, follow-up students in the supervised occupational experience program, and have limited formal contact with school administrators regarding supervision or observation of instruction. There appears to be no systematic procedure for planned sustained communication as far as the vocational agriculture teachers and school administrators are concerned in the schools included in this study.

The results of this study suggest that communication linkages are not well established between vocational agriculture teachers and school principals in this state. While there seems to be general agreement about community support for vocational agriculture programs and community resources are being used to fulfill educational needs through the granting of extended contracts, the data suggest that there does not seem to be open, candid and clear communications between principals and teachers about the true essence of vocational agriculture.

RECOMMENDATIONS

How can school administrators know what vocational agriculture programs are doing? No one can be enlightened without full access to the facts. School administrators must know what the vocational agriculture program is trying to accomplish, how it is going about achieving its objectives, how well it is succeeding, and the problems it is encountering. This information should be written and shared with school administrators and advisory committee members. Merely dispensing this information will not ensure understanding or acceptance, but it is a beginning of the development of a systematic strategy of communication. With these comments in mind and using the results of this study, the following recommendations are proposed:

1. Vocational agriculture teachers should develop a systematic approach to communication.
2. Vocational agriculture teachers should make communications a vital part of every instructional management decision; Identify problems, possible alternatives and suggestions, and submit written reports regarding the program.

3. Vocational agriculture teachers should consider keeping a time log and submit it in writing to the school administration.

4. Vocational agriculture teachers should consider writing specific annual program goals and objectives and submit these to the advisory committee and school administrators.

5. Vocational agriculture teachers should consider building a data-base of information from the community regarding educational needs and goals. This data gathering process could be done through advisory committees.

6. Vocational agriculture teachers should consider submitting monthly calendars of activities to school administrators regarding activities.

7. Teacher educators should consider conducting research studies that focus on the use of various communications strategies to determine impact on school climate - especially as it relates to vocational education in general and vocational agriculture in particular.

SUMMARY DISCUSSION

This study underscores a key problem among agricultural educators. We do a good job of talking up our programs to each other, but do we really communicate with the key decision makers outside of our interest area? Decision making depends upon a complicated process of communication of information (Owens, 1970). The amount of information available for decision making has been shown to affect the quality of decisions made (Shaw and Penrod, 1962). The more information is generally known, the greater the chance it will be accepted and acted upon (Torrance, 1955).

Vocational agriculture programs cannot operate in a shell. There must be a free flow of information if the vocational agriculture program is to survive. This study raises several concerns regarding the future of vocational agriculture in schools where decision makers are vague as to what is really happening in these programs.

The results of this study indicate that teacher educators and the profession as a whole should devise communication models for teachers to follow in establishing and maintaining communication linkages with school administrators.

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Table 1
Perceptions of High School Principals and Vocational Agriculture Teachers Regarding the Interest Shown for Vocational Agriculture Programs

Item	Principal (n=169) Mean / S.D.	Teacher (n=207) Mean / S.D.	T-value	Probability
To what extent does the community support the vocational agricultural program in your school district?	3.94 .74	3.89 .77	.54	.586
To what extent does the principal take an interest in your vocational agriculture program?	4.15 .85	3.51 1.01	6.58	.000
To what extent do the students take an interest in the vocational agriculture program?	3.46 .78	3.76 .72	-3.81	.00
To what extent do you look forward to your working day?	4.45 .53	3.76 .89	8.94	.000

Table 2
Perceptions of High School Principals and Vocational Agriculture Teachers Regarding Openness and Approachability in Their Schools

Item	Principal (n=169) Mean / S.D.	Teacher (n=207) Mean / S.D.	T-value	Probability
To what extent does the principal freely talk to teachers about school matters?	3.88 .88	3.43 1.09	4.35	.000
To what extent do the students talk to teachers about school matters?	3.47 .76	3.89 .69	-5.47	.000
To what extent is the principal's behavior seen as friendly and supportive?	4.16 .81	3.74 1.05	4.21	.000
To what extent is the principal friendly and easily approached?	4.14 .81	3.77 1.06	3.65	.000

Table 3
Perceptions of High School Principals and Vocational Agriculture Teachers Regarding Team Work

Item	Principal (n=169) Mean / S.D.	Teacher (n=207) Mean / S.D.	T-value	Probability
To what extent do you have confidence in teachers in your school?	3.98 .93	3.82 .69	1.99	.047
To what extent do teachers have confidence in the principal?	4.14 .49	3.62 1.03	6.03	.000
To what extent do administrators, teachers and students work as a team in your school?	3.94 .47	3.19 .82	10.51	.000
To what extent does the principal express appreciation when teachers do a good job?	3.85 .64	3.30 1.07	5.77	.000
To what extent does the administration use suggestions made by teachers?	3.69 .74	3.11 .94	6.47	.000

Table 4
Perceptions of High School Principals and Vocational Agriculture Teachers Regarding Problem-Solving in Their Schools

Item	Principal (n=169) Mean S.D.	Teacher (n=207) Mean S.D.	T-value	Probability
To what extent are teachers in your school helpful in solving school problems?	3.80 .61	3.32 .91	5.87	.000
To what extent is the communication open and candid between the principal and teachers in your school?	4.07 .56	3.28 1.00	9.13	.000
To what extent does the principal offer new and useful approaches to problems?	3.26 .81	2.94 .95	3.41	.001
To what extent does the principal thoroughly explain various school procedures in your school?	3.60 .81	3.50 .95	1.16	.248

Table 5
Perceptions of High School Principals and Vocational Agriculture Teachers Regarding Communications and Support for Program Development

Item	Principal (n=169) Mean / S.D.	Teacher (n=207) Mean / S.D.	T-value	Probability
To what extent does the principal give useful information?	3.69 .92	3.18 .97	5.10	.000
To what extent does the principal let teachers do their work the way they think best?	3.89 .85	4.20 .85	-3.42	.001
To what extent do teachers and the principal discuss programs and course objectives?	3.47 .77	3.11 .95	3.95	.00
To what extent does the vo. ag. teacher and the principal discuss the FFA activities?	3.60 .78	3.30 .94	3.28	.001
To what extent does the vo. ag. teacher and the principal discuss supervised occupational experience programs?	2.82 1.01	2.41 .89	4.07	.000
To what extent has community resources been used in teaching vocational agriculture this past year?	3.53 .91	3.40 .91	1.34	.182

CRITIQUE

Problems Encountered By Beginning Vocational Agriculture Teachers in Louisiana

by
Lane B. Beard and Michael F. Burnett

Summer Programs of Vocational Agriculture in the United States

by
Susan S. Camp and Joe W. Kotrlik

Perceived Communications and Support Linkages of High School Principals and Vocational Agriculture Teachers

by
Robert A. Martin, Emmanual Nwozuzu and Amy Gleasson

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PROBLEMS ENCOUNTERED BY BEGINNING VOCATIONAL AGRICULTURE TEACHERS IN LOUISIANA

by
Lane B. Beard and Michael F. Burnett

Several recent studies in agricultural education have been completed that described the successes and problems of beginning teachers in agriculture. This study attempted to identify the problems encountered by beginning teachers in Louisiana and some methods of helping these teachers improve their effectiveness in these problem areas. The researchers are to be commended for developing a study that makes a meaningful contribution to the research base in this area.

The paper referenced several recent studies that identified problems encountered by beginning teachers. The purpose and objectives of the study were clearly stated and the procedures were for the most part clearly presented. Statistical analysis procedures were appropriate and sufficient to allow the objectives of the study to be adequately discussed.

The study was descriptive in nature and potential errors were addressed in the following ways:

> Sampling error - Since this was a census study, no sampling was performed, and this did not constitute a threat to the interpretation of the results.
>
> Frame and selection error - The authors described their methods of ensuring the accuracy of the list of subjects in the population.
>
> Nonresponse error - The final response rate was 100 percent, removing the potential for nonresponse error.
>
> Measurement error - Content validity of the instrument was established. However, the authors did not report procedures for estimating the reliability of the instrument. Since the Likert-type items on the questionnaire were not summed, internal consistency estimates would not have been necessary. However, the stability of responses should have been measured through test-retest procedures.

As a reviewer of the study, it was unclear to me what research problem was being investigated. The researchers indicated a need to identify problems experienced by beginning teachers in Louisiana and similar studies were reported. Yet the authors also discussed several previous studies that dealt with teacher turnover, without making the connection (or possible connection) between teacher turnover and problems encountered by beginning teachers. Was the actual problem being investigated the high teacher turnover rates in vo-ag and the high percentage of teachers with one or two years of experience leaving the profession?

The 33 problem situations contained both problems encountered in fulfilling one's teaching responsibilities, as well as problems that were strictly associated with the job (i.e., inadequate salary, long hours, etc.). I would like to have seen some specific discussion on the magnitude of each of these types of problems.

Let me raise some questions for consideration which may be helpful in planning follow-up studies:

(1) It would seem to me that the problems identified would, once ranked, also represent the major areas of needed inservice. Was it necessary to ask respondents to react to an additional list of 15 inservice topics. How were these 15 topics determined?

(2) I was also curious as to the timing of the study during the first year of teaching. Was the questionnaire mailed early or late in the year? Why was the beginning teacher population defined as first and second year teachers. How might we expect first and second year teachers to respond differently to this type of questionnaire? Would it have been helpful to have looked at the relationship between some demographics (e.g., number of students) and their overall perceptions of the magnitude of problems encountered?

(3) With such a small population and considering the objectives of the study, was the possibility of conducting personal interviews with the subjects considered? Were any additional comments received in the spaces allocated for such? The circumstances of this study seemed to provide an excellent opportunity for an in-depth analysis of problems experienced by beginning teachers.

Finally, I would liked to have seen the authors discuss the similarity of these results with those previous studies cited in the introduction. Some conclusions and recommendations did not appear to be clearly supported by the findings presented. The respondents in this study rated YF and adult programs low on their problem list Was that because they were successful in providing these programs or that they philosophically believed that YF and adult programs were not a priority for them? Respondents also displayed a lack of interest in graduate courses and supervision as possible means of helping resolve problems. The need for developing a communication network between teachers appears very strong.

SUMMER PROGRAMS OF VOCATIONAL AGRICULTURE IN THE UNITED STATES

by
Susan S. Camp and Joe W. Kotrlik

In recent years extended contracts in vocational agriculture have been under close scrutiny. With growing pressures for accountability in all educational programs, and decreasing dollars from federal and state sources to support extended contracts, summer programs in vocational agriculture may currently be in a pivotal time in history. The authors of this study are to be commended for seeking data that will better describe the summer facet of vo-ag programs. In addition, the authors examined summer programs from a national perspective in an effort to get a firmer handle on the big picture, as opposed to a piece of it. The procedures provided some input from both teachers and state supervisors. The purpose and objectives of the study were clearly stated and appropriate procedures were used to analyze the data. Although the procedures were somewhat confusing they were well documented in most cases.

The potential errors in survey research were addressed as follows:

Frame and selection error - The 1982 Ag Teachers Directory served as the list of subjects in the population. However, this directory contained the names of teachers in the 1981-82 year and this study dealt with teachers employed during the 1982-83 year. The paper did not indicate how the frame was updated for 1982-83. I assume the directory was also used to identify state supervisors.

Sampling error - This did not present a problem with the supervisors, since all 50 responded in the study. A systematic random sample was selected from the population of teachers.

Nonresponse error - This was not a threat to the validity of data obtained from the supervisors, since a 100 percent response was obtained. However, nonresponse error posed a major threat to the validity of the data obtained from the teacher sample. Only 52 percent of the 400 teachers selected from the population were included in the data sample. Data were not obtained from the other 48 percent. Therefore, results can only be generalized to the accepting sample.

Measurement error - Three questionnaires were used in the study. Content validity was established for the first teacher questionnaire only. Procedures for establishing the validity of the other two questionnaires were not discussed, nor were procedures for estimating the reliability of any of the three instruments.

The following points of discussion are raised for the purpose of improving this paper and suggesting ideas for future research procedures:

1) The research problem under investigation was, as I read the paper, that teachers have more duties to fulfill during the summer months than they can get done. However, much of the dialogue regarding extended contracts has been rooted in the perception that there is not enough legitimate professional activity in the summer to support an extended contract.

2) The demographic data obtained from state supervisors describing vo-ag teachers and programs was limited. The logical connection between some of these data and the data regarding summer programs was unclear in some instances.

3) How much influence, if any, did the first teacher questionnaire, dealing with how teachers should spend their time, have on the second questionnaire that asked teachers to report after the fact how they actually spent their time? What procedures were taken to recognize and minimize this influence?

4) The method of presenting the actual T-test probability levels, accompanied by asterisks, was confusing. The common practice is to place asterisk(s) by the T-test values to indicate significance.

5) I felt that more could have been done with the demographic data gathering and analysis. For example, data should have been gathered to describe the program type in which responding teachers were involved. One would expect ag production teachers to feel and act differently with regard to their summer activities when compared to horticulture teachers. In addition, some correlational analysis would greatly contribute to the findings of the study. No related studies were cited in the paper. Conducting a thorough review of related research would have provided better insight into the variables to be included and their potential relationships. Although eleven sources were listed in the references at the end of the paper, only one was cited in the text. Was any thought given to collecting supervisors' perceptions of appropriate summer activities?

6) Finally, the conclusions drawn from the data were limited. I felt the authors had basis for several other noteworthy conclusions which were not addressed. For example, state supervisors reported that 50 percent of teacher contract lengths are determined at the local level and 12 states have mandatory 11 or 12 month contracts. Also, teachers on the average reported that nearly one-fourth of their summer time should be devoted to SOE visits. Conclusions based upon these points would have important implications for summer programs. Similarly, the recommendations section of the paper could be strengthened by reexamining the findings and conclusions. Other recommendations can be identified that are more clearly supported by the findings presented.

PERCEIVED COMMUNICATIONS AND SUPPORT LINKAGES OF HIGH SCHOOL PRINCIPALS AND VOCATIONAL AGRICULTURE TEACHERS

by

Robert A. Martin, Emmanual Nwozuzu, and Amy Gleasson

This paper not only deals with a research problem of tremendous importance, it also presents some findings and conclusions that expand our knowledge base in this area and suggest clear directions for future action. The final concluding statements read as follows:

"The results of this study suggest that communication linkages are not well established between vocational agriculture teachers and school principals in Indiana. While there seems to be general agreement about community support for vocational agriculture programs, and community resources are being used to fulfill educational needs through the granting of extended contracts, the data suggest that there does not seem to be open, candid, and clear communications between principals and teachers about the true essence of vocational agriculture."

This study contains many strengths which warrant our attention. The topic is a significant one to the field and the outcomes of the study contribute greatly to our knowledge in this area. The paper is extremely well-written. The introduction cites readings from the literature that clearly demonstrate the logic and importance of the problem under study. The problem is clearly stated through a series of questions, but primarily that of, "How do schools currently support vocational agriculture programs and foster communication linkages?". The purpose and objectives of the study were clearly presented and paralleled closely the problem statement, procedures, and findings. The procedures used in the study were well documented. Finally, the conclusions, recommendations, and discussion sections of the paper were thorough, well-presented, and clearly supported by the findings in the study. Some important implications were apparent throughout these sections.

The study did involve survey research methods, and potential errors were addressed as follows:

> Frame and selection error - The source used to identify the members of the two target populations was not described. I assume the appropriate directories were used. Since the instrument was mailed during the summer, the potential existed for some frame error due to typical changes in teacher and administrator personnel at this time of year.
>
> Sampling error - This did not pose a threat to the study since the entire populations were used in both cases.
>
> Measurement error - The researchers described procedures employed for establishing the content validity of the instrument. In addition, a reliability estimate of the internal consistency of the instrument was reported at r = .91. However, since each item on the questionnaire

was treated separately in the data analysis, an estimate of internal consistency was not needed. The 23 Likert-type items on the survey were grouped into five areas. If the items in each of these categories had been summed, then Cronbach's Alpha would have been appropriate. I felt these grouped comparisons would have contributed to the study. Thus, test-retest procedures would have been more appropriate for assessing the reliability of the instrument.

Nonresponse error - Follow-up procedures were used to detect possible differences between respondent and nonrespondent groups. Apparently those in the responding group received only the initial mailing. A longer response period which includes follow-up procedures to secure returns from respondents is usually preferred. The researchers reported an overall response rate of 77 percent, without reporting the final response rate for each population. Procedures followed to control nonresponse error allowed for the results to be generalized to the target populations under study.

Noting that this paper and the study involved represent excellent research efforts, the following suggestions are made for improvement:

1) Since the entire populations were included and no sampling was done, parameters (not statistics) were generated and T-tests were not needed.

2) Rather than reporting the precise probability levels for test statistics, if they are needed, the common format and APA style calls for the use of asterisks beside test statistic values to indicate significance.

3) In a few cases I questioned the relevancy of some components in the constructs under question. For example, under the construct of Interest Shown for Vo-Ag Programs, the question, "To what extent do you look forward to your working day?" seemed out of place.

4) In nearly all cases, principals responded more favorably than teachers to the questions posed. Since principals were rating their own performance in many cases, could this have led to their higher ratings?

THEME: COMPUTER APPLICATIONS IN INSTRUCTION

CLASSROOM TESTING BY MICROCOMPUTER: THE EFFECT ON STUDENT PERFORMANCE AND ATTITUDE TOWARD COMPUTERS

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INTRODUCTION

Computer use in education is commonly divided into three categories: computer managed instruction (CMI), computer assisted instruction (CAI), and computers as the object of instruction. Research about computers has been mostly descriptive, focusing on current issues and uses, competencies needed by students and teachers, attitudes of students and teachers about computer use, and educational needs. Several researchers studied competencies teachers need to use microcomputer technology in vocational education classrooms (Hudson, 1983; Bowen, 1984; Roth, Tesolowski, Rankin, and Blackman, 1984).

Cantrell (1982) studied the attitudes of vocational agriculture teachers and their training needs relative to microcomputers in the classroom. She also studied inservice activities teachers need to effectively use microcomputers. Bowen, Mincemoyer, and Parmley (1983) investigated what universities were doing to prepare teachers to use microcomputers in their local programs. Chase, Gordon, and Makin developed a syetem for evaluating instructional software for vocational education programs (1984). All of these studies were descriptive or developmental in nature.

Few researchers have investigated the effects of microcomputers in vocational education regarding the affective, cognitive, and psychomotor domains. One study (Rohrbach, 1983) investigated the effect of microcomputer versus lecture-discussion in teaching graduate students a lesson in farm management. The lecture-discussion group in the Rohrbach study performed significantly better on the cognitive measure than did either of the two microcomputer groups. However, postsecondary students taught a computerized four part series of 16 lessons about basic business and consumer economics performed significantly better ($p < .05$) than students taught by conventional means (Morrison, 1984).

Two studies compared computer-based testing procedures with traditional paper and pencil tests (Cory, 1977; Biskin and Kolotkin, 1977). Cory concluded that for one of five job performance attributes studied, computerized tests could more accurately measure and predict job performance. He found that for many technical positions, specific and narrow skills associated with job performance must be measured with large scale testing programs that are usually expensive and time consuming to score (Cory, 1977). Computers, Cory concluded, could be effective with

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such testing programs. Biskin and Kolotkin (1977), meanwhile, found that students taking the Minnesota Multiphasic Personality Inventory scored just as well when tested by computer-based, teletype, or paper and pencil testing methods.

The findings of these studies are consistent with those Clark (1983) reported after his meta-analyses of the literature about the influence of media on learning. "Five decades of research suggest that there are no learning benefits to be gained from employing different media in instruction, regardless of their obviously attractive features or advertised superiority" (p. 450). Clark noted that 30 to 50% time savings for students using computers to complete lessons, as compared with conventional means, may not be tenable and practical because of the time and expense involved in developing computer-based materials. He suggests that future research concern "learner attributions and beliefs about the instructional and entertainment qualities of different media" (Clark, 1983, p. 457).

In summary, the available research tends to show that various media, including computer-based materials, bring about similar amounts of learning. Further, Johnson (1984) cautioned against using computer-based materials without adequate research findings. He indicated that such products need to be carefully tested under classroom conditions by persons without vested interests. Johnson suggested that these controlled studies investigate not only cognitive learning, but also learning in the affective and psychomotor domains.

OBJECTIVES AND HYPOTHESES

One classroom role for microcomputers was investigated in this study. Specifically, the study sought to determine (1) the effect taking an objective evaluation by microcomputer would have upon student performance, (2) the effect this method of testing would have on student attitude about computers after the evaluation, and (3) whether testing by microcomputer would require more time than conventional testing procedures.

Three hypotheses were formulated for testing ($p<.05$).

1. No significant difference in student scores on the objective final evaluation will be observed for the microcomputer-based and the conventional paper and pencil testing methods when midterm evaluation scores are used as a covariate.

2. There will be no significant difference in student attitudes about computers when the microcomputer-based and the paper and pencil testing methods are compared.

3. No significant difference in minutes needed for the evaluation will be observed for the microcomputer-based and the paper and pencil methods of testing.

PROCEDURES

The study followed the posttest only control group design identified by Campbell and Stanley (1963, p. 8). Spector (1981, p. 27) noted that experimental studies need to be replicated to minimize external validity threats, consequently, this study was designed with two replications. Replication 1 was conducted the 1983 Fall Semester and Replication 2 during the 1984 Spring Semester. Both replications were done during a Mississippi State University course, AEE 5203/7203 (Application of Computer Technology to Agricultural and Extension Education). The same instructor and teaching assistant conducted both replications.

Replication 1 was conducted at Carthage (MS) High School and Replication 2 at Petal (MS) High School. The three hour undergraduate/graduate level course is designed to provide 30 hours of lecture and 30 hours of laboratory activities. The subjects in each replication worked in pairs for 15 hours using a microcomputer and a printer to complete a series of laboratory activities. They also completed 15 hours of laboratory activities away from a microcomputer. Replication 1 met over a 15 week period (2 hours lecture; 1 hour microcomputer activities per week) and included 49 subjects. Replication 2 involved 28 subjects and met for 11 weeks (2½ hours of lecture and 1½ hours of microcomputer activities per week).

The Treatment

At the last class meeting before the final evaluation, the course instructor reviewed the areas the test would include. The students were told that half of them would take the evaluation on microcomputers and the other half with paper and pencil. The students were instructed to report to their regularly scheduled laboratory period to take the evaluation. Two stage random assignment was used to get the students into either the microcomputer or conventional testing groups. Participants in each replication were first randomly assigned to group 1 or 2 and the treatment was then randomly assigned to the two groups. The course instructor administered the final evaluation in the laboratory with one student per microcomputer while the teaching assistant gave the same evaluation in a classroom using conventional test booklets and optical scan sheets.

The testing software used in the study was available from a commercial vendor. This package presented one test item on the screen at a time and did not advance to the next item until the student entered the correct answer. Only the first response a student entered was considered right or wrong. The package informed each student what score had been achieved on the evaluation immediately after the last item was answered. The evaluation consisted of 35 multiple choice items with four choices per item. The microcomputer group was given three sample items before starting the evaluation. After the sample items were completed, the instructor fielded questions about the process. Concurrently, the teaching assistant explained the directions and fielded questions from students in the conventional group. Both teachers then proceeded to record the number of minutes each student needed to complete the evaluation. After the evaluation, the students completed an instrument designed to measure their attitudes toward computers.

Instrumentation and Data Analysis

The three dependent variables measured in this study were: (1) minutes to complete the evaluation, (2) score on the evaluation, and (3) score on the attitude survey about computers. The 35 item evaluation instrument was developed by the instructor and reliability coefficients from 10 prior administrations ranged from .78 to .90. The conventional test group data were used to compute reliability coefficients which were .80 for Replication 1 and .78 for Replication 2. The 10-item additudinal instrument was validated by a panel of experts and yielded a .74 Cronbach's alpha reliability coefficient for Replication 1 and .76 for Replication 2.

RESULTS

Demographic data by treatment and control group are provided in Table 1 for Replications 1 and 2. The mean age for the 49 Replication 1 subjects was 33.8 years (treatment 34.9; control 32.5). The 28 subjects in Replication 2 were older, 38.4 mean years (treatment, 42.7; control, 34.1). There were 38 females in Replication 1 (7 females in Replication

Table 1

A Comparison of Treatment and Control Groups by Selected Variables for Replications 1 and 2

Variable	Treatment[a]	Control[a]	Overall[a]
Mean Age	34.9; SD=12.9 (42.7; SD=8.8)	32.5; SD-9.4 (34.1; SD=7.9)	33.8; SD=11 (38.4; SD=9.3)
Sex			
Males	7 (9)	4 (12)	11 (21)
Females	18 (5)	20 (2)	38 (7)
Degree			
No B.S.	15 -	18 -	33 -
B.S. or Higher	10 -	6 -	16 -
Bachelor's Only	- (6)	- (6)	- (12)
Master's or Higher	- (8)	- (8)	- (16)
Marital Status			
Single	4 (2)	6 (1)	10 (3)
Married	21 (12)	18 (13)	39 (25)
Midterm Score[b]	98.4; SD=15.2 (98.8; SD=13.7)	101.6; SD=15.2 (103.9; SD=11.8)	100.1; SD=15.1 (101.3; SD=12.8)

[a] Replication 1 data presented first; Replication 2 data in parentheses.

[b] Midterm scores computed on a 125 point scale.

2). In Replication 1, 33 subjects had no bachelor's degree and 16 had a bachelor's or higher. Replication 2 consisted of 12 subjects with a bachelor's only and 16 with a master's or educational specialist degree. The midterm evaluation scores from the course were used as a covariate in the study, and are shown in Table 1. The scores for the two groups were compared using a t-test and no significant difference was found in either of the two replications (Replication 1: $t(47)=-.74$, $p>.05$; Replication 2: $t(26)=1.04$, $p>.05$).

Final Evaluation Scores (Hypothesis 1)

The objective midterm evaluation and the final evaluation were very highly correlated ($r=.77$) for Replication 1 and moderately related in Replication 2 ($r=.43$). A one-way analysis of covariance revealed that the two groups were not significantly different in terms of their score on the 35 item final evaluation. Table 2 lists the measures of central tendency and the ANCOVA for the final evaluation scores. Hypothesis 1 was not rejected for either replication.

Table 2
ANCOVA of Final Evaluation Scores by Treatment Group for Replications 1 and 2

Group	n[a]	Adjusted Means	SD
Treatment	24 (14)	28.4 (26.5)	4.27 (4.29)
Control	25 (14)	28.9 (26.3)	4.58 (4.27)

Source	d.f.	ss	MS	F
Midterm (Covariate)	1 (1)	565.8 (90.3)	565.8 (90.3)	69.5* (5.82*)
Treatment	1 (1)	2.7 (.3)	2.7 (.3)	.3 (.02)
Residual	46 (25)	374.6 (388.1)	8.1 (15.5)	-
Total	48 (27)	943.1 (478.7)	-	-

[a] Replication 2 data within parentheses.
*p<.05

Student Attitudes Toward Microcomputers (Hypothesis 2)

Since good attitudes are considered to have a positive effect upon student performance, attitudes were measured immediately following the evaluation. The mean attitudinal scores of the two groups were positive in both replications. The scale had a possible range of 10 (negative) to 50 (positive). The t-test performed for both replications indicated that Hypothesis 2 should not be rejected since the two groups had similar positive attitudes about computers (Replication 1: microcomputer, 40.9, and control, 41.0; Replication 2: microcomputer, 39.3 and control 41.4).

Minutes to Take the Evaluation (Hypothesis 3)

A t-test used to compare the two groups at the .05 alpha level indicated there was a significant difference in the time required to complete the evaluation in Replication 1. The microcomputer group took 5.7 minutes longer to complete the evaluation (32.7 vs. 27.0; $t(47)=2.36$, $p<.05$). However, there was no significant difference in minutes needed for Replication 2 (microcomputer, 22.0 vs 27.4 control; $t(16.15)=1.40$, $p>.05$). Hypothesis 3 was rejected in Replication 1, but not during Replication 2. The control group needed 27 minutes in both replications, but the microcomputer group needed 10 less minutes in Replication 2 (32 vs. 22).

CONCLUSIONS AND RECOMMENDATIONS

Based upon the findings of this study, several conclusions were developed.

1. Student performance and attitudes about computers were not affected when an objective evaluation was administered on a microcomputer.

Students who took the evaluation by microcomputer performed as well and had as positive attitudes about computers as students tested with the paper and pencil method. The findings of this study about student performance are consistent with those noted by Biskin and Kolotkin (1977).

2. The time students needed to take the evaluation by microcomputer was not consistent over two replications while almost identical amounts of time were needed by the control group in each replication.

This inconsistency suggests that more substantial study is needed relative to time needed for the two methods of testing.

Several recommendations are made as a result of this study. Since subjects on this study had used microcomputers extensively, additional research on this topic should be conducted using subjects who are not as familiar with microcomputers. These investigations are needed with a variety of college and high school students to see if consistent findings are achieved about performance and attitude. Researchers studying this topic may wish to also explore whether demographic variables such as age and sex of students influence student performance, their attitude, and time required for the two methods of testing. Time needed for the two testing methods particularly warrants further exploration since the findings of the study are inconsistent about this variable.

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MICROCOMPUTER USE IN TEACHING GRADUATE STUDENTS IN AGRICULTURAL EDUCATION

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INTRODUCTION

During the past 20 to 40 years, we have experienced the evolution of the computer into our society. Progress has been made to the point that small, inexpensive computers with expanded capabilities have become available for innumerable uses. Many schools have purchased and are purchasing microcomputers for infusion into their directed learning programs. Technology may have outrun planning in that the exact role of microcomputers in the teaching-learning process has not been well established.

Most persons seem to agree that the microcomputer will hold an important role in education in future years. Gubser (1980) and Hinton (1980) have suggested phenomonal increases in the numbers of computers both in the school and the home in the near future. There are always problems with a sudden onslaught of new technology. Like any new tool that has not been fully tried and tested, the role of the computer is in question. How do we use the computer in the classroom? Do we make the computer the teacher or do we use the computer as simply a tool in the classroom, much the same as an overhead projector? Can we do a better job of teaching certain types of material with the microcomputer than with conventional teaching methods? Will the microcomputer have different effects on students with varying levels of experience? Schmidt (1982) identified three basic types of microcomputer use in classrooms: 1) as the object of a course, 2) as a support tool, and 3) as a means of providing instruction. Foster and Kleene (1982) cited four uses of microcomputers in vocational agriculture. They included drill and practice, tutorial, simulation and problem solving.

The results of various forms of computer assisted instruction (CAI) have been somewhat mixed. Studies by Hickey (1968) and Honeycutt (1974) indicated superior results with CAI while studies by Ellis (1978), Caldwell (1980), Belzer (1976) and Curtis (1968) indicated little or no significant effect. Research reported to date has suggested that further study needs to be conducted to ascertain the effects of microcomputer-assisted instruction in teaching various subjects in a variety of learning situations. Therefore, this study was designed to provide data on the use of the microcomputer in teaching principles to graduate students in agricultural education.

PURPOSES AND OBJECTIVES

The purpose of this study was to ascertain the effects of using microcomputer-assisted instruction as compared to the lecture-discussion technique in teaching the principles and methods of cost recovery and investment credit on agricultural assets. The general research question was: How does microcomputer-assisted instruction compare with the lecture-discussion technique in teaching the principles and methods of cost recovery and investment credit on agricultural assets?

More specifically, the study attempted to answer the following questions:

1. To what extent is there a difference in the performance of students when one group is subjected to the lecture-discussion technique, one group of beginner-level microcomputer users is subjected to microcomputer-assisted instruction, and one group of intermediate-level microcomputer users is subjected to microcomputer-assisted instruction?

2. To what extent is there a relationship between the amount of time spent in using the microcomputer-assisted learning modules and student performance?

PROCEDURES

The study was conducted as a three-group controlled, quasi-experiment utilizing a post-test only factorial design (see Figure 1). It involved the use of three experimental groups, including a control group (A), a treatment group consisting of beginner-level microcomputer users (B), and a treatment group consisting of intermediate-level microcomputer users (C).

Population

The population for the study consisted of students enrolled in F-440 - Supervised Occupational Experience Programs in Vocational Agriculture, F-470 - Farm Business Management Analysis I, and F-470 - Using Computers in Teaching Vocational Agriculture. The courses were offered through Agricultural Education at the University of Missouri-Columbia during the summer of 1983. All students enrolled were in graduate school, and most were vocational agriculture instructors. Enrollment by class was: 12 in F-440, 11 in F-470 (FBMA), and 50 in F-470 (Computers). This provided 21 students for the control group from F-440 and F-470 (FBMA, 25 students for the treatment group B and 16 students for treatment group C from the F-470 (Computers) class.

CONTROL A	TREATMENT B	TREATMENT C
n = 21 persons	n = 25 persons	n = 16 persons
Lecture-discussion technique 2 -2 hour class sessions Evaluation by written tests	Microcomputer-assisted instruction (No experience) Maximum of 4 hours for instruction Evaluation by written test Record of actual time used	Microcomputer-assisted instruction (Intermediate experience) Maximum of 4 hours of instruction Evaluation by written test Record of actual time used

Figure 1

Design of the Study

Experimental Procedures

The students in F-440 and F-470 (FBMA) were used as the control group for the lecture-discussion technique. The students in F-470 (Computers) were divided into two treatment groups to receive microcomputer-assisted instruction. The class consisted of two sections, one for students with little or no microcomputing experience and one with an intermediate-level knowledge of microcomputing. This determination was made by surveying the students enrolled as to microcomputing experience and assigning them to the correct group. Students with the ability to run and edit software programs were assigned to the intermediate-level group and the remainder were assigned to the beginners group.

Demographic data were collected from all experimental subjects in relation to age, teaching experience, and knowledge and use of principles and methods relating to cost recovery and investment credit. This information was useful in the discussion of the data collected and in determining homogeneity of the control and treatment groups.

Before receiving instruction, each group was introduced to the study by giving them the same orientation to the procedures that were to be used. It was explained that the learning sessions would be followed with a written evaluation of the material presented. They were told that the evaluation score would not count toward their grade in the course but that it was important that they do as well as possible.

The classes comprising the control group were organized into 2-hour class sessions. The instructor used 2-hour sessions on two consecutive days for teaching using the lecture-discussion technique. The written evaluation was given during the first hour of the next session.

The treatment groups were given general instructions as to how to operate the microcomputer learning program and were told that they could spend a maximum of four hours in the laboratory working with the microcomputer-assisted instruction. They were given free time in the laboratory to complete this task at their own pace, and were provided with a time sheet on which to record the amount of time used. They were given two days in which to complete the task and were given the written evaluation during a one-hour time period on the third day.

Development of Materials and Instrument

The materials used in teaching principles and methods in cost recovery and investment credit with the lecture-discussion method have been in place for three years and were the basis for writing a computer teaching program. The teaching materials were updated and then validated by a former professor and a graduate student in agricultural education. The microcomputer learning modules, written in the Basic Language for the Apple II microcomputer contained the principles, methods, examples, objectives, problems, etc., to be learned by students in the segment of the class devoted to cost recovery and investment credit. It was of utmost importance that the program was capable of performing the same job as the instructor in the classroom. The computer learning program was validated by a professor in agricultural economics and a graduate student in agricultural education.

The evaluation instrument used for the study was basically similar to a type of instrument that had been used previously in classes to measure student learning. The written evaluation was subjected to the Kuder-Richardson 20 test for reliability which yielded a reliability coefficient of .889. The KR-20 was calculated using the Statistical Package for the Social Sciences library computer program package at the University of Missouri-Columbia (Nie and Hull, 1981: 256). Validity of each question was established by a panel of experts. There were 29 questions on the test, each being worth one point for a total possible of twenty-nine points.

Statistical Analysis Procedures

Null hypotheses were developed to test the research questions of the study. A one-way analysis of variance was used to test the first null hypothesis (HO_1). Any differences were isolated with the Scheffe' test. A Pearson correlation coefficient was used to determine the relationship in time spent on microcomputer-assisted instruction and student performance (HO_2). Demographic data were examined to determine the homogeneity of the control and experimental groups. An alpha level of .05 was used in testing the hypotheses. The data were analyzed with Statistical Analysis System library computer program package at the University of Missouri-Columbia (Ray, 1982).

RESULTS

The age and teaching experience of the participants varied somewhat between groups as shown in Table 1. The relative prior experience with the material being taught varied slightly between the groups. The figure on mean relative prior experience represents the number of positive answers relating to nine questions concerning experience and usage of the information being learned as a part of this study.

Table 1

Demographic Descriptors of Study Participants

	N	Mean age/ years	Mean teaching experience/ years	Mean relative prior experience with materials
Control group A	21	29.8	5.9	4.29
Treatment group B	25	33.0	8.4	4.08
Treatment group C	16	35.6	11.4	4.81
Total	62	32.6	8.3	4.34

Each experimental group was given the same written test after being subjected to the lecture-discussion or microcomputer-assisted instruction sessions as outlined in the design and procedures of the study. Mean scores and general results from each of the three groups are presented in Table 2.

Table 2

Test Scores of Control and Experimental Groups

	N	Mean score	Standard deviation	Low score	High score	Variance
Control group A	21	21.19	4.996	11	28	24.962
Treatment group B	25	14.16	5.080	7	26	25.807
Treatment group C	16	16.25	6.923	7	29	47.933
Total	62	17.08	6.294	7	29	

In order to help further explain differences in student scores, correlation coefficients were calculated to ascertain if there were any significant relationships between scores, subjects' prior experience with material, subjects' age, and years of teaching experience.

As shown in Table 3, there was a significant positive relationship between prior experience or knowledge of the material and test scores (i.e., more prior experience influenced a higher test score). The other significant relationship reported in the table between age and teaching experience was as expected but did not aid in explaining the results of this study.

Table 3

Correlation Coefficient Matrix of Prior Experience With Material, Score, Age, and Years of Teaching Experience (N=62)

	Prior experience with material	Score	Age	Years of teaching experience
Prior experience with material	1.000	.563	-.095	.055
Score		1.000	-.242	-.162
Age			1.000	.925
Years of teaching experience				1.000

Critical value at the .05 level of significance = .2500

Testing the Hypotheses

HO_1: There is no significant difference among the group means scores for students when one group is subjected to the lecture-discussion technique, one group of beginner-level microcomputer users is subjected to microcomputer-assisted instruction, and one group of intermediate-level microcomputer users is subjected to microcomputer-assisted instruction.

The results of the analysis of variance are reported in Table 4.

Table 4.

Analysis of Variance for Differences Among Control and Treatment Group Scores

Source	df	SS	F	PR>F
Model	2	578.999	9.29	0.0003
Error	59	1837.598		
Corrected total	61	2416.597		

The F value of 9.29 indicated a significant difference in group mean scores. Therefore, hypothesis one was rejected. The Scheffe' test was used to isolate more specifically where those differences occurred. As shown in Table 5, there was a significant difference between the mean score of the control group and either of the treatment groups, but there was no difference found between the two treatment groups. The test scores from the control group were higher than from either treatment group.

Table 5

Scheffe's Test for Differences Among Group Scores

Group comparison	Difference between means
Control group A - Treatment group B	7.03*
Control group A - Treatment group C	4.94*
Treatment group B - Treatment group C	-2.09

*Significant at the .05 level.

HO_2: There is no significant relationship between the amount of time utilized by the students with microcomputer-assisted instruction and students' test scores.

The hypothesis was tested by computing a Pearson Product-Moment correlation coefficient. The correlation coefficient of -.016 as reported in Table 6 indicated no significant relationship between time spent with the microcomputer-assisted instruction and test scores of students. Therefore, hypothesis two was not rejected.

Table 6

Correlation Coefficient Matrix of Time Spent and Score of Treatment Groups

	Score	Time
Score	1.000	-.016
Time		1.000

CONCLUSIONS AND/OR RECOMMENDATIONS

The following conclusions were subject to the conditions of this study: 1) the lecture-discussion approach was more appropriate than the microcomputer-assisted instruction in teaching the applications of principles and concepts, 2) the students' level of experience with the microcomputer had no effect on their test scores, so it appears that the microcomputer-assisted learning modules were as easy for the beginners to use as the intermediate-level users, and 3) the amount of time spent by students subjected to the microcomputer-assisted instruction did not significantly affect their scores when given freedom to select the amount of time spent and when varying levels of prior experience with the material were represented.

This study indicated that the lecture-discussion method of teaching was superior to the microcomputer-assisted technique in teaching the types of principles and concepts presented under the conditions described. Given free choice of time spent with the microcomputer tutorial, the students in the treatment groups spent less time in instruction than did the students in the control group. Secondly, the students in the control group were taught during regular class hours, while the treatment groups were asked to participate during free time and may not have been as motivated. Thirdly, it seemed that the peer pressure in the traditional classroom situation tended to motivate students to do well on the exam.

Since most studies have indicated that students using CAI have generally performed as well or better than students under conventional instruction, the implication is that the differences in performance found in this study should be carefully evaluated. The program planner should seek ways to monitor and/or encourage time-on-task in using microcomputer-assisted instruction in the regular program rather than using it as an add-on. The challenge for agricultural educators is to better utilize the capabilities of microcomputer-assisted instruction in the learning environment.

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MICROCOMPUTER USE AND RELATED FACTORS IN NEW YORK STATE AMONG AGRICULTURE TEACHERS, POST SECONDARY TEACHERS AND EXTENSION AGENTS

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INTRODUCTION

Computers are increasingly becoming an integral part of many phases of life including education. Teachers will need to possess skills to utilize the microcomputer in their instructional program (Helgeson, 1982). The National Center for Educational Statistics identified over 101,000 microcomputers in U.S. public schools in the Spring of 1982. Moreover, the average high school will have 16 or more microcomputers by 1985 (Camp, 1983).

A report from the New York Center for Learning Technologies (1983) revealed widespread implementation of microcomputers in the state secondary school curriculum across all educational disciplines, but less use in vocational education (including agriculture) than in other content areas. Data concerning microcomputer use in post-secondary agriculture instructional programs and extension education are limited, or not available, in New York State.

The current literature includes two conceptual categories which describe instructional uses of the microcomputer; computer assisted instruction (CAI), and computer managed instruction (CMI) (Lower, et. al., 1979). Camp (1982) considered CAI and CMI appropriate for use in agricultural instruction. However, a research base for the specific uses of the microcomputer for agricultural instruction, and the applications to secondary, post-secondary and extension settings is lacking in New York State.

Researchers, curriculum writers, teacher educators and other professionals associated with agricultural education are in need of information on the current use of microcomputers as a basis for developing high quality preservice and inservice educational programs, and curriculum materials (including software). Such knowledge is also needed by practitioners to effectively and efficiently implement this new technology in curricula. The data, procedures and materials developed from this study may also be useful to other states with a similar need for research in this area.

OBJECTIVES

The purpose of the study was to determine the extent and nature of microcomputer use by secondary and post-secondary agriculture teachers, and agricultural extension agents in New York State. This information, along with data on teacher competency needed to use the microcomputers, can then be used to (a) plan/design inservice courses, and (b) develop curriculum materials (including software) that are compatable with hardware and peripherials used by teachers and agents.

The specific objectives were to determine for secondary and post-secondary agriculture teachers, and agricultural extension agents:

1. The characteristics of age, employment background, source of ability on microcomputers,and attitude toward use of microcomputers.

2. The scope of students/clients served, and students'/clients' ability and attitude toward use of microcomputers.
3. Institutional/agency characteristics regarding microcomputers.
4, The number by type of the hardware and peripherials used.
5. The adequacy of microcomputer hardware and software currently available for instructional and management use.
6. The funding sources for microcomputers currently available.

PROCEDURES

The design selected for the study was descriptive/correlational. The population for the study consisted of three sub-groups in New York State: (a) secondary agriculture teachers (N = 333), (b) post-secondary agriculture teachers at the two-year college level (N = 151), and (c) agricultural cooperative extension service agents (N = 179). The lists of 1983-84 secondary and post-secondary agriculture teachers and extension agents published by the State Education Department, SUNY System and Cornell Cooperative Extension, respectively, were reviewed for accuracy by experts from each of the areas. Revisions were made prior to data collection based on recommendations from a review panel.

One instrument was developed for all three subgroups of the population. Items that applied only to agriculture teachers or extension agents were appropriately labeled. Nominal and interval level data were collected to meet the objectives of the study.

Content validity of the instrument was determined through review by a panel of experts including representatives from secondary, post secondary, and extension agricultural programs; computer science; the microcomputer industry; educational psychology, and developers of curriculum materials. A field test by 36 individuals in the population randomly selected in proportion to numbers in the subgroups was used to determine the Cronbach's alpha reliability coefficient of .91.

Questionnaires were mailed to the three subgroups in the population. An initial follow-up letter, and a second letter enclosing a post card to request a duplicate questionnaire were used to encourage respondents to return the questionnaire. The response rates were 62 percent (206) for secondary teachers, 48 percent (73) for post-secondary, and 76.5 percent (137) for cooperative extension agents. An eight percent random sample of non-respondents from each of the groups was contacted by phone to obtain their response to the survey. An analysis of responses from post-secondary teacher and extension agent non-respondents showed no major differences between respondents and non-respondents. However, secondary teacher non-respondents were different in terms of being non-users of computers, and teaching in area occupational centers or in New York City.

Data analysis was performed using the SPSS-X computer program at the Cornell University Office of Computer Services.

FINDINGS

Introduction

Descriptive, rather than inferential statistics were used in data analysis since the total population was used for the sample. Frequencies, percentages and means were calculated for each of the three subgroups (secondary agriculture teachers, post-secondary agriculture teachers, and agriculture extension agents). Also, Cramer's V was selected for a descriptive measure of association/relationship since the variable of subgroup is nominal level data and the other data variables were either nominal or interval. The levels for Cramer's V were defined as high (.70 - 1.0), substantial (.50 - .69), moderate (.30 - .49), and low (.00 - .29).

Educator Characteristics

Most advanced degree. Almost all (92.8%) teachers had at least a Bachelors Degree, and most (88.8%) post-secondary teachers held the Masters Degree or higher. The association level between groups was moderate (.33).

Years as agriculture teacher and extension agents. The mean number of years of secondary teaching experience by secondary teachers was 10.1. Twenty-two percent of post-secondary and five percent of extension agents reported 5.3 and 4.8 years of secondary experience, respectively.

Post-secondary teachers averaged 11.28 years of post-secondary experience. Six percent of secondary teachers had a mean of 5.38 years of post-secondary experience, and four percent of agents averaged 5.6 years.

Extension agents averaged 10.51 years tenure in their field. Four percent of secondary teachers had a mean of 5.33 years extension experience, and 6.8 percent of post-secondary teachers averaged 10.83 years of extension work.

Age. The age distribution of the three groups was similar with each group having 79.1 percent, 72.0 percent, and 75.2 percent, respectively distributed in age ranges 26-50. The association level between groups were only .18 (low).

Sex. Most (range of 83.2 - 91.8%) secondary and post-secondary teachers, and agents are males.

Source of ability to use microcomputers. Over one fourth (26.2%) of secondary teachers reported no ability to use microcomputers compared to only 12.4 percent of agents and 19.2 percent of post-secondary teachers. Post-secondary teachers had more (43.8%) college classes on microcomputers than secondary teachers (16.5%). Over 65 percent of agents reported Cornell University Inservice courses as the mechanism for developing these computer skills compared to 11 percent for the other two groups. Informal consulting was reported by over one-half of all three goups. About 30 percent of secondary teachers listed high school or BOCES courses as opposed to less than nine percent for other groups. The associaiton levels between groups were low for all sources of ability.

Attitude toward use of microcomputers. Over 94 percent of all three groups were "Positive" or "Very Positive" toward use of microcomputers in their teaching.

Student/Clients

Number of students in school. Seventy-nine percent of secondary teachers reported a total school population of 1500 students or less.

Population served by agents. A majority (60.2%) of agents serve a community school area with a population of 100,000 or less.

Student/Client ability. A majority of respondents in all population subgroups reported 10 percent or less as the proportion of students/clients able to use microcomputer hardware, software, and peripherials. Moreover, post-secondary students had the highest ability, and extension clients the lowest. Cramer's V values were moderate or low.

Student/Client attitudes. The overall attitude of secondary and post-secondary students, and extension clients toward use of microcomputers was positive. The percentage who were "Positive" or "Very Positive" ranged from 95.3 percent for post-secondary to 88.9 percent for secondary students. Extension clients were intermediate with 89.6 percent.

Institutional Agency Characteristics

Most (92%) county associations and a majority (59.2%) of colleges support microcomputer inservice on work time whereas a majority (57.8%) of secondary schools prefer inservice not on work time. Instituitions/agencies in general (79% or more) do not provide reimbursement for classes. However, only 8.8 percent of secondary teachers, 2.8 percent of post-secondary teachers, and 1.5 percent of agents reported their institution/agency as not supporting development in use of microcomputers. Over 93 percent of teachers and agents agreed that their immediate supervisor supported instructional uses of microcomputers. The agreement on local agencies adequately coordinating use of microcomputers was 60.4 percent by agents, 72.2 percent by secondary teachers, and 86.4 percent by post-secondary teachers.

The groups reported by 50 percent or more of respondents as being actively involved in planning instructional use of microcomputers were microcomputer industry representatives, teachers/agents, advisory boards and students/clients with most being at the 70 percent plus level. About 50 percent of secondary teachers, 80 percent of post-secondary teachers, and 45 percent of agents felt there was an adequate system for evaluation of hardware.

Microcomputer use

Approximately one-half of teachers (47.8%), and post secondary teachers (50.7%), and three-quarters of agents were presently using microcomputers or planned to do so in 1984-85. The measure of association among groups using Cramer's V statistic was low (.27).

Microcomputer Hardware and Software availability

The question pertaining to the number of respondents who used, or planned to use, microcomputers served as a screening question. Hence, descriptive statistics reported from this point refer to the 235 respondents who answered "Yes" to this question unless otherwise indicated. Those who answered "No" were directed not to continue as the questions would either be non- applicable, or beyond the expertise of individuals with little or no knowledge of microcomputers. Hence, the number of respondents to this section of the questionnaire was reduced to 92 secondary teachers, 36 post-secondary teachers, and 97 extension agents.

Of the individuals who currently used or plan to use microcompuers in their instruction 61 percent had access to only one microcomputer, 25.3 percent to between two and four microcomputers, and 13.7 percent to five or more microcomputers. The mean number of microcomputers available for instructional use was 4.00 for the respondents who planned to use microcomputers in 1984-85. When comparing the 13 different manufacturers of microcomputers identified by respondents, approximately one-half (44.0%) of the respondents reported the availablity of Apple computers, one-fourth (29%) IBM microcomputers, and 17 percent radio shack. There was a moderate degree of relationship among the groups for the number of microcomputers available for use and the manufacturer of microcomputers.

The types of microcomputers most frequently used were the IBM PC (32%) and the Apple IIe (31%), followed by the Apple II+ at 14 percent. The degree of association among groups on the types of computers used was substantial. Thirty-one respondents owned a personal computer. Apple, Radio Shack, and Franklin were reported most frequently by 44, 22 and 14 percent of respondents, respectively. The Apple II+ was the most popular microcomputer owned individually by 29.6 percent of the respondents. A high level of association exists between agriculture secondary teachers, post-secondary, and extension agents on the types of microcomputer owned.

Thirty-seven percent of the 235 respondents who use, or plan to use, microcomputers within the next year have a printer for their microcomputer. Thirty-nine percent of the extension agents, 17 percent of agriculture teachers, and 17.8 percent of post secondary agriculture instructors have access to microcomputer printers for teaching purposes. The degree of association among groups on the number of printers available for teaching was low. Considering other types of peripherial devices for the microcomputer, a modem, classroom display monitor and color monitor were available to 37.2, 23.2, and 19.3 percent of the respondents, respectively. Each of the peripheral devices--plotters, acoustic couplers, paddle controls, graphics tablets, synthesizers, light pens, and networking devices within a classroom, were available to less than eight percent of the respondents. A low degree of association among the groups was found on the availability of peripheral devices except for modems where a substantial level coefficient (Cramer's V of .65) was found.

Adequacy of Computer Hardware and Software

Mean score ratings on a likert type scale (1=Strongly Disagree to 4=Strongly Agree) were used to determine the adequacy of facilities and equipment. The average mean score ratings for agriculture teachers at the secondary and post-secondary levels, and extension agents, with regard to adequate types, numbers, arrangements and access to microcomputers was 2.6, 2.4, 2.4, and 2.5, respectively. Post-secondary teachers consistently rated items the highest, and extension agents the lowest on all items except adequate number of microcomputers for which secondary agriculture teachers provided the highest rating. A low measure of assocation among groups was recorded for all four items.

Adequacy with regard to instructional software was determined by the same type of four point rating scale described in the previous section. The areas of access, availability of multiple copies, quality, and documentation had mean ratings of 2.4, 2.1, 2.1, and 2.1, respectively by the three groups. Agriculture teachers rated all items higher than did extension agents and post-secondary teachers except for the area of multiple copies for which extension agents provided the highest rating. Measures of association were low for all items.

Software for the purpose of managing an instructional program was rated in the same manner as the previous items. Average ratings for the areas of access, quality, and documentation were 2.4, 2.5, and 2.4, respectively. Considering the three types of respondents, post-secondary teachers rated all three items the highest, and extension agents ratings were the lowest. A moderate level of association was found for the groups of respondents on the adequacy of instructional management type software.

Use and Support for Microcomputers

One hundred and forty respondents (60%) of the 235 respondents who planned to use the microcomputer in 1984-85 presently use microcomputers (54 secondary teachers, 21 post-secondary teachers, and 62 extension agents). Only respondents who are presently using microcomputers were asked to provide data for the findings which follow. Either a higher level of knowledge was required to respond to three questions, or the type of question only applied to users.

The percent of the agriculture extension agents', post-secondary teachers' and secondary teachers' job which involves microcomputers was five percent or less for 61.9 percent of the respondents. By groups a higher percent (53%) of post-secondary teachers use microcomputers in more than 10 percent of their job as compared to agriculture teachers (41.5%) and extension agents (20%). A low level of association was found for the groups on the extent of microcomputer use.

The perceived use of microcomputers within the next two years was projected to increase by 89.1 percent of the respondents as compared to 10.2 percent who said it would remain the same. One respondent indicated that less use was anticipated. A higher percent (91.9%) of extension agents indicated an increase than did post-secondary teachers (85.7%) and secondary teachers (87.0%). A low level of association was found among the groups with regard to future use of microcomputers.

Microcomputers were purchased exclusively or through some combination of, vocational education grants (VEA), regular or county budgets, and industry budgets in 27.5, 48.6, and 1.4 percent of the cases, respectively. The percent of respondents who did not know the source of funding was 14.5 percent. Considering the two major sources of funding, VEA grants were instrumental at secondary (52.7%) and post-secondary (42.9%) levels. The use of operating budgets to purchase microcomputers varied from a high of 66.7 percent of respondents in post secondary to 32.7 percent in secondary education. The Cramer's V statistic revealed a low level of association among the three groups on types of funding to purchase microcomputers.

The use of networking with microcomputers by the SCAMP, Agristar and Schoolbus networks was reported by 57.3, 3.1, and 2.1 percent of the respondents, respectively. Forty-one percent of the respondents who use microcomputers do not use networking. The most frequent use (86.7%) of SCAMP was with extension agents.

An average of 30.9 percent of the software used by agricultural extension agents, post-secondary teachers, and secondary agriculture teachers came from commercial sources which is the most frequently reported source. About fifteen percent of the respondents used software secured from non-profit agencies, personally developed, and other educational agencies. The measure of association (using Cramer's V) among the groups on sources of software was in the medium, to high range.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations that follow are based on the data analyzed in this study.

Conclusions

1. The educational degree levels of secondary agriculture teachers and extension agents are similar. Therefore, joint inservice should be pedagogically feasible.

2. Career mobility between secondary agriculture teaching, post-secondary teaching, and extension is limited.

3. Extension agents have significantly more access to Cornell University microcomputer inservice courses than do secondary and post-secondary teachers; hence, the need for inservice for secondary and post-secondary teachers is greater.

4. Agriculture teachers and agents have a very positive attitude toward the use of microcomputers in teaching. Therefore, they would be receptive to inservice and use of curriculum materials.

5. The students/clients of teachers and agents need instruction on use of computer hardware, software and peripherals; and their positive attitude toward the use of microcomputers indicates interest in such instruction.

6. County extension agencies and colleges support inservice on work time whereas the majority of secondary schools do not. This means that planning for inservice courses must be sensitive to the schedules of secondary agriculture teachers.

7. Institutions/agencies generally support the use of microcomputers by secondary and post-secondary agriculture teachers and extension agents.

8. Teachers/agents, industry, advisory boards and students/clients are usually involved in planning for microcomputer use in instruction.

9. Systems to evaluate software should be strengthened in secondary schools and cooperative extension.

10. Agriculture teacher and agent use of microcomputers will increase during 1984-85.

11. The potential for use of microcomputers by agricultural educators is limited by the low number of microcomputers accessible for instructional use.

12. Apple and IBM microcomputers are used more frequently than other types of microcomputers, and are about equal in their extent of use. This suggests that preservice and inservice should develop competencies to use these two types of microcomputers.

13. Most agricultural educators do not have access to peripheral devices for their microcomputer. If they have any, they are likely to have a printer or modem. Extension agents are more likely to have peripheral devices than secondary or postsecondary teachers.

14. In general, post-secondary agriculture instructors perceive themselves as being better able to use microcomputers in terms of access to facilities, equipment, instructional software, and management software than do secondary agriculture teachers and extension agents. Extension agents have perceived lower access than the other two groups.

15. For agricultural educators who plan to use microcomputer technology, there is sufficient access to equipment, facilities and software to begin implementation. However, the accessibility problem tends to limit potential development of microcomputer technology at the present time.

16. The use of microcomputers is higher in post-secondary agriculture programs than in secondary and extension. This could be explained by greater accessibility to hardware and software.

17. Extension agents have a greater level of anticipated increased use than the other two groups. Since agents also had the greatest problems with accessibility to hardware and software, strategies to resolve access to equipment needs to be a high priority.

18. Agricultural educators should not rely upon, nor anticipate, contributions of hardware or software from industry; rather, they should look to other sources of funding such as vocational education grants or the regular school/county budgets.

19. Networking systems which can be utilized within the operating budget (e.g. SCAMP in the extension service) will be adopted.

20. Commercial software packages are the primary source of software for agricultural educators although loans from schools and other persons, and personally developed software, are heavily utilized.

21. The characteristics of microcomputer use by agricultural secondary teachers, post-secondary teachers, and extension agents are similar, yet enough difference exist to warrant addressing some unique applications.

REOMMMENDATIONS

1. Provisions should be made to provide agriculture teachers access to Cornell University inservice courses on computers, particularly secondary teachers who have a low level of expertise.

2. Inservice and curriculum materials should be made available to agriculture teachers and extension agents.

3. Software evaluation systems should be expanded and improved, particularly in secondary schools and cooperative extension.

4. Strategies should be identified for making appropriate use of microcomputers for instruction when limited access to hardware, software, and facilities is a problem. These strategies could include:

    a. Using large monitors, or a projection apparatus, to demonstrate software programs to groups of people/classes and/or conducting group activities with the program,

    b. Establishing small group rotation plans around an activity center which includes a microcomputer work station,

    c. Selecting software that runs quickly and can be used in conjunction with other written work.

5. Software developers should concentrate on IBM and Apple compatible programs if they wish to match the present type of hardware used for agricultural instruction, and management of instruction.

6. Extension agents should explore opportunities to utilize post-secondary and secondary agricultural facilities, equipment and software to overcome inadequacies when instructional computing facilities are needed.

7. Agricultural educators should develop realistic expectations with regard to using microcomputers for instruction, and the management of instruction while recognizing limitations imposed by limited access to hardware and software. This may result in exploration and a gradual phasing process for implementation of microcomputer use into the curriculum.

8. Agricultural educators should include microcomputer hardware and software in their present and long range budgets. Extension agents will have to be particularly attentative to this area since equipment purchases in extension funding have traditionally not been a large budget item.

9. Agricultural educators should explore using data bases through networking as an alternative strategy for dealing with limited software, and the high cost of software programs.

10. Strategies and linkages should be developed to share non-copyright software among agricultural educators. A high level of caution should be exercised to make sure copyrighted items are not reproduced.

11. Recruitment practices for agriculture teachers and extension agents should stress employment of females.

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CRITIQUE OF COMPUTER APPLICATIONS IN INSTRUCTION PAPERS
ELEVENTH ANNUAL NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETING

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INTRODUCTION

One of the most written about and talked about innovations in recent time has been the microcomputer. Some say it will be boon to education and some say it is a passing fad. One thing is sure: the microcomputer is becoming a common instructional tool in many agricultural education programs across the country. It is our responsibility as agricultural educators to find the most appropriate uses for this innovation. You have just heard three presentations about computer applications in instruction. Each paper makes its own contribution to the body of knowledge in agricultural education. All three papers are high quality efforts by sincere professionals.

My comments concerning each paper will come from the manuscripts submitted to me for review. This is a limitation since this review precluded the oral presentations you have just heard.

CRITIQUES

Classroom Testing by Microcomputer: The Effect on Student Performance and Attitude Towards Computers

My comments regarding this research paper are as follows:

The authors used the introduction section of the paper very well to develop the problem and to review related literature. This procedure also helped to establish the need for this particular research project. The introduction was well written and to the point.

The objectives were clearly written in hypothesis form. The authors left no doubt concerning which aspects of the classroom use of computers they were going to study.

The study appropriately employed the posttest only control group design. The experiment was conducted twice and results were kept separate. This was a commendable step and tended to strengthen the project; however, there were some differences between the two replicates. These differences were in the number of weeks the classes met; 15 weeks vs. 11 weeks. The research procedures were clearly explained.

The treatments involved an instructor developed exam and additudinal instrument administered either by computer or by paper and pencil. The reliability coefficients for the exam were established from prior usage. The reliability of the attitudinal instrument was checked using Cronbach's alpha coefficient. The coefficents were all above .74 indicating that the instruments were sufficiently reliable. The authors added credibilty to the results of the experiments by establishing and reporting the reliability for the instruments.

Table 1 shows a comparison of treatment and control groups by selected variables for each replication. It is in this table that the reader can see that there were major differences between the two groups studied.

These differences were primarily in the distribution of males and females, and the educational levels of the groups. These differences could tend to lead to different results between the two experiments.

Analysis of Covariance was selected to analyze the results for the exam scores (performance). The covariate was the midterm exam score. The use of ANCOVA helped to correct for any differences between the experimental and control groups. The results were clearly listed in table form. A t-test was appropriately used to analyze attitude and time required to complete the exam.

The authors made several conclusions and suggested a few recommendations for further study. The conclusions were appropriate and stemmed directly from the findings. The authors did note the inconsistencies between the two replicates but did not make specific recommendations to address the inconsistencies. It appears that additional replications of the experiment may be needed to overcome the inconsistencies.

In summary, the authors are to be commended for a well written paper. It also addresses an important area in agricultural education.

MICROCOMPUTER USE IN TEACHING GRADUATE STUDENTS IN AGRICULTURAL EDUCATION

My comments regarding this research paper are as follows:

The introduction was well written and utilized the results of several other similar research studies to establish the problem for this study. Several studies were cited which indicate that computer assisted instruction (CAI) is an effective teaching tool. This study compared the use of CAI or lecture-discussion techniques in teaching the principles and methods of cost recovery and investment credit on agricultural assets.

The purpose and objectives for the study were clearly stated. They were written in question form. This made it possible for the authors to develop two hypotheses for the study.

The population for this study consisted of students enrolled in three different graduate level classes at the University of Missouri. It was not clear how subjects were assigned to the three groups. Subjects were not randomly assigned to treatment and control groups. This condition could cause some internal validity problems due to selection bias.

The computer program used for the two CAI groups was developed from the materials that had been traditionally used to teach the principles and methods of cost recovery and investment credit by the lecture-discussion method. All materials and evaluation instruments were validated by knowledgable persons. The evaluation instrument was tested for reliabilty and a coefficient of .889 was obtained. This care in developing the instruments and testing for reliability contributed to the validity of the experiment.

The statistical techniques used to analyze the data seemed appropriate for the experiment. A one-way analysis of variance was used to test the first hypothesis and the Scheffé test was used to locate the differences among means. A Pearson correlation coefficient was used to test the second hypothesis.

The findings are presented in a logical, orderly fashion. The tables are complete and help to illustrate the results. Table 1 shows the differences among the three groups by age, teaching experience, and prior expereince with materials. The age and teaching experience of the three groups varied widely. If subjects had been randomly assigned to groups these differences may have been reduced.

Three conclusions were presented in the Conclusions and/or Recommendations section of the paper. Each conclusion was supported by the findings presented in the paper. There were few specific recommendations concerning the use of CAI or for further research in CAI. Some specific recommendations would strengthen the paper. Also, it could be mentioned in this section that research procedures and/or experimental conditions could have had an effect on the results.

In summary, this is a well-written paper that makes a contribution to the body of knowledge in this new area of agricultural education.

MICROCOMPUTER USE AND RELATED FACTORS IN NEW YORK STATE AMONG AGRICULTURE TEACHERS, POST SECONDARY TEACHERS AND EXTENSION AGENTS

My comments regarding this reserch paper are as follows:

The introduction set the stage for this study by citing related literature and explaining the current conditions in New York. It also gave several reasons why this study was important in that state.

The purpose and objectives for the study were clearly stated. Six broad objectives were listed forming the framework for the collection of data in this descriptive/correlational study.

The population consisted of three large groups: secondary agriculture teachers, post secondary agriculture teachers, and agricultural extension agents. The data collection instrument was mailed to the whole population (663). The rate of return ranged from a low of 48% for post secondary teachers to a high of 76.5% for agricultural extension agents. It is possible that random sampling procedures would have allowed the researchers to concentrate more resources on increasing the response rate. It is commendable that a telephone follow-up of non-respondents was utilized. The researchers noted that the non-respondents tended to be non-computer users.

The development of the data collection instrument was particularly well done and well documented. The data collection instrument was validated by experts and field tested by 36 individuals randomly selected from the population. In addition, the instrument was tested for reliabilty and a coefficient of .91 was obtained.

The authors chose not to use inferential statistics, instead they utilized descriptive statistics only. The reason given was that the total population was used for the sample. It could be argued that since not all the population responded, those who did respond constituted the sample. One could then make a case for using inferential statistics in order to infer to the population.

The data were presented in narrative form and no tables were used. The data were presented in the same order as the objectives. It would be easier for the reader to put the findings in perspective if some of the data were tabled. It was difficult to compare and contrast the three subgroups without tables and some of the data were not reported.

A series of 21 conclusions and 11 recommendations were listed in the Conclusions and Recommendations section of the paper. Even though each one seemed to be plausible, it was difficult to tie each of the conclusions and recommendations back to the findings because not all the data were reported and none were tabled.

In summary, this paper is logically organized and well written. However, this is a rather large study that does not seem to lend itself well to an 11 page paper. A longer version of the paper is needed to adequately present and explain the wealth of data concerning the six objectives of the study.

SUMMARY

In summary, I would like to make the following general statements:

First, it is encouraging to read and hear about three diverse research projects which address the field of computers and computer assisted instruction. This is a new field of endeavor for agricultural educators. These research efforts show our commitment for making the best use of instructional technology.

Second, I would like to compliment each of the authors on the quality of each of the research efforts into this area. Each paper makes a contribution to the body of knowledge in agricultural education.

THEME: TEACHING STRATEGIES

STUDENT REACTIONS TO REFLECTIVE TEACHING: A FORM OF LABORATORY TEACHING EXPERIENCE

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Student Reactions to Reflective Teaching: A Form of Laboratory Teaching Experience

INTRODUCTION

Reflective teaching is a method of providing laboratory teaching experience in a preservice teacher education program. Reflective teaching is described by the originator as "'competitive' peer teaching where several teachers vie to accomplish the same objective with different groups of pupils composed of peers" (Cruickshank, 1980). During reflective teaching a class is divided into small groups of five to seven students. One student from each group is designated as that group's teacher. All the designated teachers are then given the same lesson to teach to their small group and a few days in which to prepare. The material given to the designated teachers contains the objective of the lesson, the length of time allowed in which to teach the lesson, and the information about the topic to be taught. No methods for teaching the lesson are suggested.

The designated teachers all start teaching their groups simultaneously when the college instructor gives a signal. When the time allotted for teaching the lesson (normally 10-15 minutes) is up, the instructor signals for all teaching to stop. A test over the information taught is administered and graded by the designated teachers. The test is developed by the college instructor and is based on the lesson's behavioral objectives. The designated teachers have not previously seen the test.

Following the test the students complete an evaluation form about their designated teacher. Meanwhile the teachers grade the test and complete an evaluation form concerning their own teaching performance. The groups are then provided with a set of questions to discuss which concentrate on the teaching procedures used. This requires the group to reflect back on the teaching-learning experience which occurred.

As a conclusion the entire class meets in a large group. Data about each small group is recorded on the blackboard, such as teacher preparation time and mean test scores. All the designated teachers explain how they attempted to teach the lesson. The college instructor then leads the class in a discussion of the teaching-learning experience using observations made by students, designated teachers, and the college instructor, as well as data recorded on the blackboard, in order for the class to form ideas and opinions about effective teaching.

At the present time, few studies have been conducted on reflective teaching. However, through a research grant from the Exxon Education Foundation, a comprehensive study was conducted by Cruickshank (1980) and his colleagues to test reflective teaching as a means of improving laboratory teaching experiences. Peters (1980) conducted a study to compare the effects of microteaching and reflective teaching on teacher education students' self-concepts, attitudes toward and perceptions of teaching. Peters and Moore (1981) replicated the study by Peters (1980) with an additional variable, students' teaching performance as measured by their student teaching grades. Research evidence has indicated that reflective teaching is effective in providing students the opportunity to practice teaching and to receive feedback. It has also been proven to be effective in improving the students' critical thinking abilities with regard to teaching and learning.

Frequently when a new course or idea is implemented, students' reactions serve as a partial evaluation of the new implementation. Such has been the case with reflective teaching. If this new idea is to be relevant in the "eyes of the students" and if it is to meet their needs and expectations, information concerning students' likes and dislikes about reflective teaching should be taken into account.

PURPOSE AND OBJECTIVES

The major purpose of the study was to determine the feasibility and use of reflective teaching in an introductory teacher education course. Specifically, the study made an attempt to answer the problem of just how relevant students think reflective teaching is in an introductory teacher education course.

METHODOLOGY

The research design used in this study was the one-shot case study design (C&S design 1). Although this design has serious faults to both internal and external validity, the researcher would like it understood that this study was designed to seek students' reactions to the use of reflective teaching; thus a pretest would not be in order at this time. It should also be noted that the researcher was handicapped by the four other ED 249 instructors who were hesitant to incorporate any new addition to the course syllabi. If the students find reflective teaching to be a relevant part of ED 249 then perhaps their attitudes might have a direct impact on the ED 249 instructors.

The experimentally accessible population was students at Purdue University who enrolled in ED 249, Directed Experience in Schools, during the fall semester, 1983. The subjects consisted of undergraduates in the School of Agriculture, School of Consumer and Family Sciences, and School of Humanities, Social Science and Education.

These students (N=39) were members of six different sections of the previously mentioned course. To fulfill their optional activities required for the course, these students agreed to participate in three 2-hour reflective teaching sessions.

The reflective teaching sessions followed the format previously discussed. Each student taught a demonstration behavior-type lesson to a small group of peers. The lessons were designed so that neither the designated teacher nor the students would have any prior knowledge of the concept being taught. The titles of the five lessons used in the study are: "The Semaphore Task", "The Origami Boat Task", "The Bowline Task", "The Manual Alphabet Task", and "The Origami Butterfly Task". Each designated teacher was given the lesson 1 week prior to its being taught. The lessons given the students contained the objective of the lesson, the length of time given to teach the lesson, and the information necessary in order for the teacher to prepare to teach a lesson.

INSTRUMENTATION

Two major instruments were used in this research. They were: Student's Reaction to Laboratory Teaching Experience and My Experience With Reflective Teaching. Both instruments were used as posttest only measures.

The 15-item, Student's Reaction to Laboratory Teaching Experience, instrument is a slight modification of the instrument designed by Klingstedt (1976). The alpha reliability of this instrument is .87. A four-point Likert-type scale was used with this instrument. A score of 60 was the highest possible score and would indicate an extremely favorable perception of the value of reflective teaching.

The 36-item, My Experience With Reflective Teaching, instrument also identifies students' attitudes toward their 6-hour experience with reflective teaching. This instrument is a slight modification of the instrument which was developed and used by Cruickshank (1980) and his colleagues. The alpha reliability of this instrument is .92. A six-point Likert-type scale was used with this instrument. A score of 216 was the highest possible score and would indicate an extremely favorable attitude toward the use of reflective teaching.

RESULTS AND DISCUSSION

Responses were obtained from all 39 participants. Frequencies and percentages were calculated for each item on each instrument and are presented in Tables 1 and 2. The overall reactions of the students to each item are arranged in descending order based on the average mean score. The higher the mean score, the more positive their attitude toward reflective teaching.

In general, students' reactions to reflective teaching were very positive. Table 1 presents a summary of the students' responses to the 15 items on the instrument which measured the students' perceptions of the value of the reflective teaching.

An analysis of students' reactions revealed that the majority of the students felt their reflective teaching experience:

1) was very applicable to actual teaching on the job - 87% (Item 1).

2) caused them to be less nervous than if they were in a real classroom teaching situation - 92% (Item 2).
3) would be difficult to replace by other, more ordinary experiences - 85% (Item 3).
4) is very beneficial early in the teacher education program - 74% (Item 4).
5) was not embarrassing and discomforting - 79% (Item 5).
6) was time well spent - 72% (Item 7).

Table 2 presents a summary of the students' responses to the 36 items on the instrument which collected additional information on the students' experience with reflective teaching. Although the table is self-explanatory, a few observations concerning some of the more significant findings seem appropriate at this point. The majority of the students felt that reflective teaching:

1) could be easily used in other teacher preparation institutions - 93% (Item 1).
2) was a good on-campus teaching experience - 97% (Item 2).
3) provides an inexpensive form of teaching practice - 92% (Item 3).
4) would be of benefit and enjoyed by other teacher education students - 84% (Item 4).
5) rated highly with other activities contained in teacher education classes - 94% (Item 6).
6) should be a regular part of ED 249 - 84% (Item 7).

In addition to the structured responses called for on the instruments, students also added comments on a separate sheet of paper. Some of their remarks were:

> "Everyone who is interested in teaching should try reflective teaching". . ."It gives you a good idea of what will occur in the classroom". . ."It is time well spent". . . ."Rewarding and helpful experience". . . ."Helped me to be more at ease with myself and I have gained confidence in teaching as my career" . . ."Helps you to realize what the teacher thinks and feels about successes and failures and at the same time brings to your attention some things that you as a learner have done to help or to hinder the teaching process". . . ."Mistakes were tools for learning and not tools for humiliation". . . ."I think I would be missing a lot if I hadn't taken reflective teaching."

CONCLUSIONS

From the information gathered on the instruments, it appears that indeed students do think that reflective teaching is an effective and relevant technique for use in an introductory teacher education course. One student who had been very positive about his reflective teaching experience summed up his participation with the statement, "This experience has made me more comfortable about my choice to be a teacher."

Based on the reported findings and student comments, it appears that students feel that reflective teaching is relevant to their needs in the teacher preparation process. As teacher educators, one of our concerns should be that of meeting students' needs. If we strongly believe in relevancy, then we should further explore the use of this form of laboratory teaching experience.

It should also be noted that the other ED 249 staff members became interested in reflective teaching based on their students' comments and as a result are more positive toward the use of reflective teaching in ED 249.

TABLE 1

STUDENT'S REACTION TO LABORATORY TEACHING EXPERIENCE[a]

Item	As used in our class, reflective teaching:	Not True	Slightly True	Somewhat True	Very True	Mean
1.	had little application to actual teaching on the job.	87%	13%	0%	0%	3.87
2.	made me more nervous than I would have been in the classroom, thus reducing my effectiveness.	92%	3%	0%	5%	3.82
3.	could easily be replaced by other, more ordinary experiences.	85%	10%	5%	0%	3.80
4.	is very beneficial early in the teacher education program.	0%	0%	26%	74%	3.74
5.	was embarassing and discomforting.	79%	15%	3%	3%	3.72
6.	was not much more than a novel experience.	76%	18%	3%	3%	3.68
7.	was time well spent.	0%	5%	23%	72%	3.67
8.	was helpful initially, but its beneficial effects diminished with continued use.	69%	21%	10%	0%	3.60
9.	has given me an increased appreciation for the necessity of adequate preparation for teaching.	3%	8%	18%	72%	3.59
10.	indicated areas where I can make improvement.	0%	13%	21%	67%	3.54
11.	aided in self-evaluation.	3%	8%	28%	62%	3.49
12.	raised doubts within me that I can become a successful teacher.	62%	18%	13%	8%	3.33
13.	has helped me regard teaching more seriously.	3%	10%	39%	49%	3.33
14.	has given me a feeling of competence as a teacher.	3%	10%	62%	26%	3.10
15.	changed in a positive direction, the image I have of myself as a teacher.	3%	23%	44%	31%	3.03
	Total Score[b]					53.31

a. Very True = 4, Somewhat True = 3, Slightly True = 2, Not True = 1. The scoring of negative items (1, 2, 3, 5, 7, 8, 12) was reversed.

b. Total Score possible = 60

TABLE 2

MY EXPERIENCE WITH REFLECTIVE TEACHING

Item	As a result of your six hour experience with reflective teaching to what extent:	I strongly do not believe 1	2	3	4	I strongly believe 5	6	Mean
1.	do you believe reflective teaching could be used easily in other teacher preparation institutions?	0%	0%	0%	8%	32%	61%	5.53
2.	do you believe you have a positive attitude toward reflective teaching as an on-campus form of teaching experience?	0%	0%	0%	3%	46%	51%	5.49
3.	do you believe reflective teaching provides an inexpensive form of teaching practice?	0%	0%	3%	5%	37%	55%	5.48
4.	do you believe other students would enjoy and benefit from reflective teaching?	0%	0%	3%	13%	18%	66%	5.47
5.	do you believe that shared or common teaching experience is valuable when learning to teach?	0%	0%	0%	5%	46%	49%	5.43
6.	do you value reflective teaching compared with other activities contained in education classes?	0%	0%	0%	6%	47%	47%	5.42
7.	do you believe reflective teaching should be part of ED 249?	0%	3%	3%	11%	18%	66%	5.42
8.	do you believe reflective teaching should be a regular part of teacher education?	0%	0%	0%	16%	31%	53%	5.37
9.	do you believe that reflective teaching provides worthwhile additional on-campus opportunities to engage in teaching?	0%	0%	0%	8%	50%	42%	5.34
10.	do you believe your participation in reflective teaching will help you in teaching a lesson at the school you are observing?	0%	0%	5%	8%	40%	47%	5.29
11.	do you believe four to six persons constitute a good sized reflective teaching group?	3%	0%	5%	11%	34%	47%	5.16
12.	do you believe your teaching may be improved?	0%	0%	0%	10%	64%	26%	5.15
13.	do you believe you feel more positively to reflecting on and talking about teaching?	0%	0%	0%	13%	59%	28%	5.15

TABLE 2 Cont.

MY EXPERIENCE WITH REFLECTIVE TEACHING

	As a result of your six hour experience with reflective teaching	I strongly do not believe				I strongly believe		
Item	to what extent:	1	2	3	4	5	6	Mean
14.	do you believe what you have learned in reflective teaching will transfer to use when you teach in other contexts?	0%	0%	0%	24%	45%	32%	5.08
15.	do you believe reflective teaching let you see how others would teach?	0%	0%	3%	18%	47%	32%	5.08
16.	do you believe you know more about the act of teaching and the role of the teacher?	0%	0%	3%	18%	51%	28%	5.05
17.	do you believe reflective teaching helped you to find out more about yourself as a teacher?	0%	3%	3%	18%	39%	37%	5.05
18.	do you believe you know more about how others react to your teaching?	0%	0%	5%	13%	56%	27%	5.03
19.	do you believe you feel more positively toward the role of teaching?	0%	0%	3%	18%	54%	26%	5.03
20.	do you believe reflective teaching provides a scaled-down, controlled, supervised learning experience.	0%	0%	5%	21%	50%	24%	4.92
21.	do you believe reflective teaching caused you to think about teaching in an interrelated way?	0%	3%	3%	27%	38%	30%	4.89
22.	do you believe you are better able to identify factors that affect teaching and learning?	0%	0%	0%	23%	67%	10%	4.87
23.	do you believe you feel more positively toward yourself as a teacher?	0%	3%	5%	18%	51%	23%	4.87
24.	do you believe you are likely to admit that a new experience has had an effect on your thinking and behavior?	0%	0%	5%	21%	55%	19%	4.86
25.	do you believe reflective teaching provides you with feedback or knowledge of how well you did as a teacher?	0%	5%	3%	28%	32%	32%	4.82

TABLE 2 Cont.

MY EXPERIENCE WITH REFLECTIVE TEACHING

Item	As a result of your six hour experience with reflective teaching to what extent:	I strongly do not believe 1	2	3	4	I strongly believe 5	6	Mean
26.	do you believe reflective teaching helped you to explore teaching as a career?	3%	5%	8%	8%	53%	24%	4.74
27.	do you believe that you have improved your performance in the teaching skill area you practiced in your reflective teaching lesson (e.g., demonstrating)?	0%	3%	8%	21%	54%	15%	4.72
28.	do you believe reflective teaching permitted you to try out your teaching style?	5%	3%	8%	29%	24%	32%	4.58
29.	do you believe reflective teaching challenged you to make your lesson interesting?	3%	5%	5%	29%	34%	24%	4.58
30.	do you believe you are better able to bring about student achievement and satisfaction?	0%	3%	5%	34%	50%	8%	4.55
31.	do you believe you could better project hypothesis about teaching and learning?	0%	5%	10%	33%	41%	10%	4.41
32.	do you believe that you are able to think of a greater variety of ways to accomplish a learning objective?	0%	3%	13%	34%	42%	8%	4.39
33.	do you believe your attitudes toward teaching and learning have changed?	3%	8%	15%	54%	21%	0%	3.82
34.	do you believe your ideas about teaching and learning have changed?	8%	8%	10%	51%	21%	3%	3.77
35.	do you believe televising reflective teaching would affect your performance positively?	8%	18%	18%	29%	11%	16%	3.63
36.	do you believe that more than six hours of reflective teaching experience would be beneficial generally?	8%	21%	21%	26%	13%	11%	3.47
	Total Score[a]							175.91

a. Total Score Possible = 216

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THE EFFECT OF A FLORAL MERCHANDISING AND DESIGN RECORD BOOK ON STUDENT ACHIEVEMENT

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INTRODUCTION

Historically, students who had been studying floral design and had submitted record books to the Pennsylvania State FFA Record Book contest had to use the Record Book of Practicum Skills (n.d.). Clearly this book did not meet all the needs of floriculture students.

Informal conferences with Pennsylvania vocational horticulture teachers seemed to indicate a need for a floral merchandizing and design record book. A review of literature indicated that there were both, a need for record-keeping skills in the floral industry, and that very few experimental studies examined the effects of a record-keeping system on student achievement. A new floriculture record book was needed by students who were studying floral design in Pennsylvania.

Rhodes (1979) developed a floral merchandising and design record book to meet this need. Field testing of the publication was needed to determine its effectiveness on student achievement.

OBJECTIVES

Purpose of the Study

The purpose of this study was to field test a floral merchandising and design record book. The relationships between the use of the record book and achievement in producing a profit making floral design and in cognitive development were examined.

Specific Objectives

1. To compare the cognitive achievements of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

2. To compare practicum floral design quality achievement of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

3. To compare floriculture business calculation achievement of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

4. To compare floral design income achievement of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

Hypotheses

1. There is no significant difference in mean cognitive achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

2. There is no significant difference in mean floral design quality achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

3. There is no significant difference in mean floriculture business calculation achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

4. There is no significant difference in mean floral design income achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials.

METHODS

Experimental Design

A quasi-experimental design was chosen for the study. The design, which includes four post treatment observations, is shown diagrammatically as follows:

R	X_1	O_1	O_2	O_3	O_4	4 intact classes
R	X_2	O_5	O_6	O_7	O_8	4 intact classes

Eight schools with vocational horticulture-floriculture programs within the southeast quarter of Pennsylvania were selected according to sampling criteria. The eight programs were randomly assigned to one of the two levels of treatment. Four classes received the Floral Merchandising and Design Record Book and four posttests; four classes received only the teachers' traditional materials and four posttests.

The symbols represent the following:

R	represents random assignment of intact classes to one of the levels of the treatment.
X_1	represents the students receiving the Floral Merchandising and Design Record Book.

X_2	represents the students receiving only the teachers' traditional instructional materials.
O_1, O_5	represent the cognitive posttest.
O_2, O_6	represent the practicum design-quality posttest.
O_3, O_7	represent the floriculture business calculation posttest.
O_4, O_8	represent the practicum design-income posttest.

The dependent variables in the study were (1) student achievement scores on a cognitive test, (2) student achievement scores on a practicum design-quality test, (3) student achievement scores on a floriculture business calculations test, and (4) student achievement scores on a practicum design-income test. The cognitive test was in the form of a multiple-choice written test and was administered as the first (O_1,O_5) set of posttests. The design-quality test required each student to create a round centerpiece flower arrangement at a ten dollar maximum cost to the designer. The test was evaluated according to the standard FFA floriculture contest score card. The floriculture business calculations test consisted of ten floriculture business problems with multiple- choice answers. The design-income test required students to complete the floral design cost sheet for the round centerpiece floral arrangement created for the design-quality test. The two levels of the variable in the study were (1) the *Floral Merchandising and Design Record Book*, and (2) the teachers' traditional instructional materials.

A floral design achievement test was used to pretest students in both treatment groups. No significant differences were found. Interaction and selection of the treatment limits the generalizability of the study. Since the study was conducted in a limited area of the state, no conclusive data are available to suggest that the target population of this study represents all vocational horticulture floriculture classes in Pennsylvania. Therefore all results are related back to the eight horticulture classes in the southeast quarter of Pennsylvania included in the study. Threats to external validity include: interaction, selection and treatment. Reactive effects of experimental arrangements, as explained by Tuckman (1978), were controlled by conducting the research under normal classroom conditions during the regular school calendar.

Development of Design Variables

The *Floral Merchandising and Design Record Book*, an independent variable, was developed by Rhodes (1979). A 50-question multiple-choice floriculture exam and a ten-question floriculture business calculation exam were developed to be used as dependent variables for this study. These tests were examined for content validity by two horticulture teachers in Pennsylvania and two faculty members of the Department of Agricultural and Extension Education at The Pennsylvania State University.

A floriculture arrangement practicum score card was adapted from the Pennsylvania State FFA Floriculture contest to be used as a dependent variable in the study. The final dependent variable, a floral design cost sheet, was developed to be used with each arrangement recorded in the record book.

Analysis

A standard t-test was used to test for significant differences between treatment groups. The study was conducted in the fall semester of 1981. Eight vocational horticulture teachers and 99 vocational horticulture students (eight intact groups) from eight high schools and area vocational-technical schools participated in the study. All schools were located in southeastern Pennsylvania.

RESULTS

Hypothesis 1

Hypothesis 1—There is no significant difference in mean cognitive achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials—was not rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 26.52, and the mean score for students receiving the teachers' traditional instructional materials was 25.88. The probability of significance was .57. Hypotheses were rejected at the .05 significance level.

Table 1. Student Scores on a Cognitive Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	26.52	4.82	- .57	.57
Traditional Instructional Materials	43	25.88	6.01		
Total	99	26.20	5.42		

Hypothesis 2

Hypothesis 2—There is no significant difference in mean floral design quality achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials—was not rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 84.38, and the mean score for students receiving the teachers' traditional instructional materials was 80.79. The probability of significant difference was .10. Hypotheses were rejected at the .05 significance level.

Table 2. Student Scores on a Practicum Floral Design Quality Achievement Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	84.37	8.37	-1.66	.10
Traditional Instructional Materials	43	80.79	12.13		
Total	99	26.20	5.42		

Hypothesis 3

Hypothesis 3--There is no significant difference in mean floriculture business calculation achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials--was not rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 6.54, and the mean score for students receiving the teachers' traditional instructional materials was 5.95. The probability of significant difference was .16. Hypotheses were rejected at the .05 significance level.

Table 3. Student Scores on a Floriculture Business Calculation Achievement Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	6.54	1.77	-1.42	.16
Traditional Instructional Materials	43	5.95	2.19		
Total	99	6.25	1.98		

Hypothesis 4

Hypothesis 4--There is no significant difference in mean floral design income achievement scores of students receiving the Floral Merchandising and Design Record Book and students receiving only the teachers' traditional instructional materials--was rejected. The mean score for students receiving the Floral Merchandising and Design Record Book was 6.87, and the mean score for students receiving the teachers' traditional instructional materials was 3.37. The probability of significant differences was .00. Hypotheses were rejected at the .05 significance level.

Table 4. Student Scores on a Practicum Floral Design Income Achievement Test by Level of Instructional Treatment.

Instructional Treatment	n	Mean	s	t	Probability
Floriculture Record Book	56	6.87	391.00	-6.62	.00
Traditional Instructional Materials	43	3.37	56.80		
Total	99	5.12	223.90		

CONCLUSION

The principal conclusion of the investigation was that the Floral Merchandising and Design Record Book was effective in helping students obtain a higher floral design income. The results supported the belief that the sudents who received the Floral Merchandising and Design Record Book would score higher on a practical floral design income test than students who received only the teachers' traditional instructional materials.

Recommendations

Based on the findings and conclusions resulting from this study, the review of literature, and the experience of the investigator in conducting the study, the following recommendations are made.

1. Teachers of vocational horticulture should encourage students to use the Floral Merchandising and Design Record Book to help increase the students' floral design income. The results of this study indicated that student floral design income was higher when they used the Floral Merchandising and Design Record Book.

2. The Department of Agricultural and Extension Education at The Pennsylvania State Universiy should carry the Floral Merchandising and Design Record Book for sale to vocational horticulture programs in Pennsylvania.

Recommendations for Further Study

1. Research should be initiated to determine the effects of the use of a floral merchandising and design record book on the ability of students to make decisions about related flower shop management practices.

2. The study should be replicated by having larger school and student population participation.

3. A study should be conducted to examine the effects of a floral merchandising and design record book on student achievement randomly assigning treatments to students.

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TEACHER AND STUDENT REACTIONS TO STUDENT ASSISTED INSTRUCTION: A TEACHING STRATEGY FOR THE VOCATIONAL AGRICULTURE CLASSROOM

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TEACHER AND STUDENT REACTIONS TO STUDENT ASSISTED INSTRUCTION: A TEACHING STRATEGY FOR THE VOCATIONAL AGRICULTURE CLASSROOM

INTRODUCTION

The times demand that we learn more, learn it faster, remember it better, and apply it more skillfully. Teacher and learner productivity must rise sharply. How much change can we get if we apply known principles of teaching and learning? Teaching strategies such as lecture, lecture discussion, demonstrations, etc., have been in use by vocational agriculture teachers for a number of years. Although the technical information covered by these teaching strategies is being used to prepare students for the world of work, one has to ask if there are any new teaching strategies appearing on the horizon that may improve the productivity of both our vocational agriculture teachers and vocational agriculture students.

PURPOSE AND OBJECTIVES

The purpose of the study was to determine the feasibility and use of a new teaching strategy, Student Assisted Instruction (S.A.I.), for use by teachers in the vocational agriculture classroom. Specifically, the study made an attempt to determine the effectiveness of S.A.I. as a new teaching strategy.

WHAT IS S.A.I.?

S.A.I. is a form of peer teaching during which several students, acting as teachers, simultaneously teach the same short lesson to several small groups of their peers. S.A.I.'s potential for use in high school vocational agriculture classrooms is tremendous. The vocational agriculture teacher can divide the class into small groups of four to six students each, designate one person from each group as that group's teacher, and give all the "teachers" an identical lesson to prepare to teach. The lesson topics can be drawn directly from the material ordinarily covered in the course. Extension publications, portions of textbook chapters, and publications provided free by industries are examples of teaching materials which can be used. Selecting topics which can be covered adequately in the time allotted is of importance.

The students designated as teachers should be given a few days in which to individually prepare to teach the lesson to their small groups. On the assigned day, the designated teachers all simultaneously teach their small groups the same lesson (or teach toward the same objective) with a time constraint of 10 to 15 minutes. The objective of the lesson will depend upon what is being taught. For example, the objective of the lesson for students enrolled in a production agriculture class would be to correctly answer test questions on the care of the baby pig at birth.

At the conclusion of the assigned period of time, the designated teachers must stop teaching. The students will then be allowed to discuss and ask specific questions of their teacher concerning the material covered, allowing five to seven minutes for discussion. A short evaluation can then be made of the students' achievement. This short written test should be provided by the vocational agriculture teacher. Each group can grade their tests to see how well they did in comparison with the other groups. A large group discussion follows, conducted by the teacher, to summarize the material which was taught. The teacher should involve all the students in a discussion of the lesson, bringing out key points that might have been stressed by the designated teachers. These key points can be written on the blackboard and should go into the students' notebooks to be used for reference at a later date.

A vocational agriculture teacher can easily have a new set of teachers and a new lesson the next day. With five students to a group, one week's worth of classes can be taught by the students; or perhaps a particular day of the week, such as Friday, can be set aside for S.A.I.

METHODOLOGY

The research design used in this study was the one-shot case study design (C&S design 1). Although this design has serious faults to both internal and external validity, the researcher would like it understood that this study was designed to determine the feasibility and use of a new teaching strategy. If the new strategy is found to be interesting and effective by both students and teachers, then more sophisticated research designs can be used in future studies. By having a large number of participants involved in the study, the reliability and validity of the evaluative research is greatly enhanced.

The experimentally accessible population consisted of students enrolled in high school vocational agriculture programs in the state of Indiana during the spring 1984 semester. The subjects were students enrolled in a variety of vocational agriculture programs and classes throughout the state.

These subjects (N=496) were students of vocational agriculture teachers who were enrolled in a graduate level course, ED 645 (Problems in Agricultural Education), Spring Semester, 1984. To fulfill part of their course requirements, the teachers (N=12) developed five S.A.I. lessons for each of their classes. A total of 163 S.A.I. lessons were developed and used.

The S.A.I. sessions followed the format previously discussed. Each student taught a lesson to a small group of peers. Each designated teacher was given the lesson several days prior to its being taught. The students were given time during supervised study to work on their lessons and to receive help from their teacher. It should be noted that this study took the entire semester (16 weeks) to complete.

INSTRUMENTATION

The major instrument, Student Assisted Instruction Evaluation Form, was used in this research. The 31-item posttest only instrument, developed by the researcher, measured students' reactions to their involvement in S.A.I. The alpha reliability of this instrument is .88.

A four-point scale was used with this instrument. A score of 124 was the highest possible score and would indicate an extremely favorable perception of the value of S.A.I.

An open-ended question, "What would you tell a new student coming into your class who will be participating in S.A.I.?", was completed by the vocational agriculture students. The teachers were also asked to respond to a question, "Why would I use S.A.I. again?". They also listed what they considered to be advantages and disadvantages of using S.A.I.

RESULTS AND DISCUSSION

Responses were obtained from all 496 participants. Frequencies and percentages were calculated for each item on the instrument and are presented in Tables 1 through 12. The overall reactions of the students to each item is arranged in descending order based on the average mean score. The higher the mean score, the more positive their attitude toward S.A.I.

In general, students' reactions to Student Assisted Instruction were positive. Although the tables are self-explanatory, a few observations concerning some of the findings seem appropriate at this point. The majority of the students:

1) felt that as a result of their opportunity to teach, they realize that teaching is not as easy as it looks - 80% (Table 1, item 2).
2) overall rated S.A.I. as very effective - 69% (Table 1, item 5).
3) said they enjoyed this method of presentation because they were able to participate - 68% (Table 1, item 7).
4) would like more instruction presented in this way - 67% (Table 1, item 8).
5) agreed that they learned more by participating in S.A.I. than if the teacher had only covered the material - 59% (Table 1, item 12).
6) found S.A.I. a very satisfying learning activity - 75% (Table 2, item 1).
7) said S.A.I. was an interesting approach to learning - 77% (Table 5, item 1).

8) agreed teaching and learning material this way was challenging - 79% (Table 9).
9) would encourage their teacher to use S.A.I. - 68% (Table 11).

In addition to the structured responses called for on the instrument, students' responded to the open-ended question, "What would you tell a new student coming into your class who will be participating in S.A.I.?". Some of their remarks were:

1) It's a lot of fun, and is very interesting.
2) It makes learning easier and a lot more fun.
3) It's a great new experience.
4) It is not as hard as it may look.
5) I enjoyed it and it will be a good experience and you will learn a lot if you work at it.
6) I would tell them that it is somewhat difficult and to make your lesson effective you'll have to do some work and not just read the information it gives you. If every student, not just a few, puts their full effort into this project it can be very effective.
7) That he has to work a little bit harder and it's a bit of a drag but it's worth it because you learn alot easier this way.

The teacher comments as to why they would use S.A.I. again were very positive. Some of their remarks were:

1) S.A.I. allows students to research and learn about the subject matter, then the teacher can inform them in more depth.
2) S.A.I. is an excellent tool for advanced classes.
3) S.A.I. provides students the chance to speak in front of an audience, develop organization skills, makes them feel important, and involves the student.
4) S.A.I. provides the chance for the teacher to be creative.
5) Promotes group learning and double learning.
6) Promotes out-of-class learning on the subject matter.
7) I will definitely be developing new S.A.I. lessons because I feel it adds some "spice" to my teaching.

CONCLUSIONS

From the information gathered on the instrument and the students' and teachers' comments on the open-ended questions, it appears that indeed students and teachers feel that Student Assisted Instruction is an effective and relevant teaching strategy for use in vocational agriculture classrooms. Although some of the percentages and means are low, they were all still over the fifty percentile. Any time someone is exposed to a new idea or concept it takes some time getting used to. All the teachers agreed that it takes more than one set of S.A.I. lessons for the students to get a feel for S.A.I. The more they use it, the more they appreciate this new type of learning activity.

Psychologists and teacher educators concerned with the principles of teaching and learning all contend that the clearer, the nearer, the more realistic and relevant the statement of desired outcomes, the more effective the learning.

It is the hope of this researcher that this study will be the foundation for further research and study of this new teaching strategy for all of education.

TABLE 1

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean
1. My teacher gave very clear instructions on how we were to do S.A.I.	30%	54%	11%	5%	3.09
2. As a result of my opportunity to teach, I realize that teaching is not as easy as it looks.	22%	58%	16%	5%	2.97
3. I would recommend that other teachers have their students participate in S.A.I.	21%	52%	17%	10%	2.84
4. S.A.I. helped develop a friendly working relationship between the teacher and myself	11%	61%	24%	5%	2.78
5. Overall, I would rate S.A.I. as very effective.	15%	54%	23%	8%	2.77
6. As a student and learner, S.A.I. encouraged me to do my best work.	13%	58%	24%	6%	2.77
7. I enjoyed this method of instruction because I was able to participate.	10%	58%	24%	8%	2.71
8. I would like more instruction presented in this way.	13%	54%	23%	10%	2.70
9. My participation in S.A.I. helped me to learn the material more easily than if the teacher taught us the material another way.	18%	44%	30%	9%	2.70
10. My participation in S.A.I. was very boring.	10%	29%	49%	12%	2.63
11. S.A.I. is a poor way for me to learn material.	13%	29%	45%	14%	2.61
12. I learned more by participating in S.A.I. than if the teacher had only covered the material.	11%	48%	31%	11%	2.59
13. As a student and teacher of S.A.I., I found it to be a very frustrating learning experience.	11%	34%	44%	11%	2.55
14. S.A.I. was enjoyed by all the students in the class.	7%	47%	36%	10%	2.52
Total Score[b]					38.23

a. Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Disagree = 1. The scoring of negative items (10, 11,13) was reversed.

b. Total Score possible on these 14 items = 56.

TABLE 2

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Satisfying	Satisfying	Not Satisfying	Not at all Satisfying	Mean
1. I found S.A.I. ______________ as a learning activity.	10%	65%	17%	8%	2.78
2. To me, S.A.I. would be ________ __________to engage in either as a teacher or learner.	9%	58%	24%	9%	2.68
Total Score[b]					5.46

a. Very Satisfying = 4, Satisfying = 3, Not Satisfying = 2, Not at all Satisfying = 1.
b. Total Score possible on these two items = 8.

TABLE 3

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Fair	Fair	Unfair	Very Unfair	Mean
1. Was the S.A.I. test________?	15%	74%	8%	3%	2.99
2. If your S.A.I. lesson had a test was it _____________?	14%	74%	8%	4%	2.97
Total Score[b]					5.96

a. Very Fair = 4, Fair = 3, Unfair = 2, Very Unfair = 1.
b. Total Score possible on these two items = 8.

TABLE 4

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Worthwhile	Worthwhile	Not Worthwhile	Not at all Worthwhile	Mean
1. To me, the subject matter or experience provided was	17%	68%	13%	3%	2.99
2. Was the subject matter you taught or the experience you were provided	15%	67%	14%	4%	2.92
Total Score[b]					5.91

a. Very Worthwhile = 4, Worthwhile = 3, Not Worthwhile = 2, Not at all Worthwhile = 1.
b. Total Score possible on these two items = 8.

TABLE 5

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Interesting	Interesting	Not Very Interesting	Not at all Interesting	Mean
1. To me, S.A.I. was	17%	60%	20%	4%	2.89
2. Was your S.A.I. lesson ____________ to teach?	13%	57%	24%	6%	2.78
Total Score[b]					5.67

a. Very Interesting = 4, Interesting = 3, Not Very Interesting = 2, Not at all Interesting = 1.
b. Total Score possible on these two items = 8.

TABLE 6

STUDENT's REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Easy	Easy	Difficult	Too Difficult	Mean
1. Was the S.A.I. test	16%	61%	20%	3%	2.90
2. To me, the subject matter to be taught and learned was	8%	64%	21%	7%	2.73
3. Was the subject to be taught ____________ to teach?	6%	64%	25%	5%	2.72
Total Score[b]					8.35

a. Very Easy = 4, Easy = 3, Difficult = 2, Too Difficult = 1.
b. Total Score possible on these three items = 12.

TABLE 7

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Long Enough	Too Short	Much Too Short	Much Too Long	Mean
1. Was the time provided to teach and learn	60%	25%	12%	3%	3.11[b]

a. Long Enough = 4, Too Short = 3, Much Too Short = 2, Much Too Long = 1.
b. Total Score possible on this item = 4

TABLE 8

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Students Learned	Students Learned a Little	Students Learned Very Little	Students Learned Nothing	Mean
1. To what extent do you think what you taught was learned?	45%	43%	9%	3%	3.29[b]

a. Students Learned = 4, Students Learned a Little = 3, Students Learned Very Little = 2, Students Learned Nothing = 1.

b. Total Score possible on this item = 4.

TABLE 9

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Challenging	Somewhat Challenging	Not Very Challenging	Not at all Challenging	Mean
1. To me, teaching and learning material this way was	23%	56%	18%	4%	2.97[b]

a. Very Challenging = 4, Somewhat Challenging = 3, Not Very Challenging = 2, Not at all Challenging = 1.

b. Total Score possible on this item = 4.

TABLE 10

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Very Adequate	Adequate	Inadequate	Very Inadequate	Mean
1. Was the teaching material you were provided	10%	68%	15%	7%	2.82[b]

a. Very Adequate = 4, Adequate = 3, Inadequate = 2, Very Inadequate = 1.

b. Total Score possible on this item = 4.

TABLE 11

STUDENT'S REATION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Definitely Use it Again	Use it Again	Probably Not Use it Again	Definitely Not Use it Again	Mean
1. Regarding S.A.I., I would encourage our teacher to	15%	53%	24%	6%	2.76[b]

a. Definitely Use it Again = 4, Use it Again = 3, Probably Not Use it Again = 2, Definitely Not Use it Again = 1.

b. Total Score possible on this item = 4.

TABLE 12

STUDENT'S REACTION TO STUDENT ASSISTED INSTRUCTION[a]

Item	Completely New to Me	Somewhat New to Me	Somewhat Familiar	Completely Familiar	Mean
1. The content of my S.A.I. lesson was	28%	34%	29%	9%	2.80[b]

[a] Completely New to Me = 4, Somewhat New to Me = 3, Somewhat Familiar = 2, Completely Familiar = 1.

[b] Total Score possible on this item = 4.

A DISCUSSION OF RESEARCH ON TEACHING STRATEGIES

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INTRODUCTION

The researchers are to be commended for their attempts to investigate teaching strategies in agricultural education. We in the profession are tempted to use the same teaching techniques and materials time after time, more because we are comfortable with them than because we know they bring about student learning. Unfortunately, we often lack the total control necessary to conduct experimental research, so we must make the best of other research designs to gather information regarding teaching strategies.

The three papers presented are examples of the types of research needed in agricultural education. Testing and evaluating new strategies and instructional materials can be done in a variety of ways. Two of the papers looked at teacher and/or student reactions to a specific teaching strategy. The other investigated the effect of a record book on student performance. I shall discuss each paper in the order presented.

STUDENT REACTIONS TO REFLECTIVE TEACHING: A FORM OF LABORATORY TEACHING EXPERIENCE

Like Dr. Peters, I am a former student of Professor Cruickshank and his reflective teaching strategy. I commend Dr. Peters in his continued efforts to use and evaluate this relatively new approach to providing laboratory experiences in preservice teacher education. The introduction to the paper is longer than usual for a presentation of this type; however, it is an excellent example of providing sufficient background of the study for the uninformed reader. We should not assume that the reader is as familiar with the subject as the researcher, and Dr. Peters has led us through a good description of the strategy investigated.

The methodology and instrumentation sections of the paper are clearly and concisely written. The design is a pre-experimental design and is appropriate for this particular study. The instruments were adapted from previous work and were found to be reliable.

Several questions need to be asked and possible weaknesses identified. The instrumentation section indicates that the two instruments are used to measure student attitudes toward the experience. I find this to be different from the stated purpose and objectives--namely, measuring student perceptions of relevancy. I admit that some of the questions do seem to pertain to relevancy, but the major portion addresses attitude. Clarity in this area would be helpful.

The findings of the study are difficult to interpret as presented in the paper. The major concern has in an overall feeling of making results "say" more than they do or leading the reader into only positive thoughts regarding the strategy studied. For example, Table 1 shows that 87% of the students indicated "not true" in response to the statement, ". . . had little application to actual teaching on the job." The discussion, however, indicates that 87% felt that the strategy, "was very applicable to actual teaching on the job." I am not sure that those two statements are equally correct. In addition, the four-point scale on "trueness" may lead respondents, since there is no opportunity for varying degrees of being "not true" as there is for "true."

The above concerns are rectified on Table 2. The different scale allows for a cleaner approach to interpretation. It should be noted, again, that only positive viewpoints were included in the results section. There was greater disparity in response and considerably lower mean scores for items 33 through 36. Perhaps that should have been indicated.

In summary, the study was interesting and adds to the body of knowledge in the profession. A tone of researcher bias pervades the document I reviewed, especially in the conclusions which were very general. Proposed further research would be helpful to the reader in putting this study in perspective with other studies on reflective teaching and on teaching and learning.

THE EFFECT OF A FLORAL MERCHANDISING AND DESIGN RECORD BOOK ON STUDENT ACHIEVEMENT

This study sought to field test a new record book among Pennsylvania vocational agriculture students. The introduction was brief but appropriate for the study and the intended reader. The purpose and objectives were clearly stated and led to statistical hypotheses. The discussion of the analysis used (t-test) and the results are clear and straight forward.

The design for the study is indicated to be a modification of the Separate-Sample Pretest-Posttest Design (Campbell and Stanley Designs #12c). If this is a modification of that quasi-experimental design, I must take issue with the modification. The use of a pretest with one of the intact groups (the control) allows the researcher to state with greater validity that differences between groups may be attributed to treatment and not extraneous variables that threaten internal validity. If the four post-test measures are considered to be four parts of one post-test measure, then the design is more in line with Campbell and Stanley's Design #3, the pre-experimental Static Group Comparison. Nothing in the study indicated that there is a reason for maintaining four separate posttest observations.

With these thoughts in mind, the tests of the hypotheses are appropriate. A level of significance was set a priori and was adhered to in the analysis. Significant differences existed on only one part of the posttest measure. Of course, the internal validity concerns minimize the impact of the finding. The recommendations for further study are appropriate.

TEACHER AND STUDENT REACTIONS TO STUDENT ASSISTED INSTRUCTION: A TEACHING STRATEGY FOR THE VOCATIONAL AGRICULTURE CLASSROOM

Comments regarding this paper parallel to some extent the reactions to the paper on reflective teaching. The researcher aided the reader by providing background information on the strategy examined. Sufficient detail is provided in the methodology and instrumentation sections.

The purpose and objectives are not clearly stated and are questioned in regard to the instrument used. The question must be raised: Does the instrument measure what the researcher wanted, namely, "effectiveness"? There is no indication, and it is doubtful.

The results and discussion section tends to lead the reader into thinking that reactions were very positive. However, Table 1 shows that only one item received a mean rating of over 3.00 on a four-point scale. The remaining 13 statements fall between "Agree" and "Disagree," a somewhat neutral zone. The same discussion could be generated regarding the remaining 11 tables.

Conclusions may be going beyond the study's findings. The use of terms seems to be the culprit. Clearer objectives may have helped the researcher be more definitive in the conclusions. Recommendations for further study would be helpful here. The researcher also failed to provide references.

SUMMARY

Again, it is important to note that the intent of these researchers is to be commended. Perhaps our enthusiasm allows us to drift away from conciseness in our reporting. At any rate, our profession needs research that helps us validate what we do and how we do it.

THEME: ISSUES IN AGRICULTURAL EDUCATION

IMPROVING ATTITUDE-RELATED MEASURES IN AGRICULTURAL EDUCATION RESEARCH: THE CERTAINTY OF RESPONSE RATING TECHNIQUE

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INTRODUCTION

Studies in agricultural education have emphasized the measurement of attitude-related concepts such as opinions, perceptions and beliefs. Also researchers in the profession appear to rely heavily on survey designs in order to measure these psychosocial phenomena (Kahler, 1983; Mc Cracken, 1970). In the 1-year period between January 1983 and December 1983 a total of 45 doctoral studies in agricultural education was reported (Dissertation Abstracts International, Vol. 43-A No.7 to Vol. 44-A No.6) and of this number 32 (71.1%) measured attitude-related variables such as degree of agreement using Likert-type instruments.

There appears to be a general consensus among experts in attitude research that measuring attitude-related concepts is a difficult scientific activity. One very important reason for this difficulty might be attributed to Elizur's (1970, p. 36) belief that "There exists no commonly accepted definition of the (attitude) concept." Also, according to Fishbein and Ajzen (1972, p. 488) "many of the apparent inconsistencies and controversies in the area are largely pseudoproblems created by this conceptual ambiguity." Conceptualists and theorists on attitudes, nonetheless, seem to continue their search for a common definition.

In the meantime, researchers remain committed to efforts towards improved methods and techniques for measuring attitudes. Some investigators in the social sciences, particularly psychology, have employed additional techniques such as confidence testing (Ebel, 1965; Jacobs, 1971; Echternacht et al., 1972) to obtain more valid and reliable measures of opinions, perceptions, or judgement. Given the high percentage of attitude-related studies in agricultural education and their associated problems of conceptual ambiguity, the lack of common definitional bases, and the great reliance on apparently questionnable measuring scales with respect to construct validity and statistical conclusion validity, researchers in the profession need to seek techniques that will improve the validity and increase the reliability of their data.

PURPOSE AND OBJECTIVES

The primary purpose of this paper is to share the idea that soliciting respondents' level of confidence ratings on psychosocial variables is a necessary additional step to improving attitude-related measures in agricultural education research. Therefore, the authors are suggesting the use of the Certainty of Response Rating Technique (CRRT) as a complementary technique to the Likert-type scales often used to measure attitudes-related variables. (Throughout the rest of the paper the approach will be referred to as CRRT). Specific objectives formulated to help achieve the above purpose were:

1. To describe the conceptual and theoretical bases of the CRRT
2. To illustrate the major functions of the CRRT using previous studies.

THE CONCEPTUAL-THEORETICAL BASE OF THE CRRT

Measuring attitudes has been an important component of social and educational research. Eagly and Himmelfarb (1978) underscored this point when they concluded that neither the attitude concept nor attitude research is dead as pronounced. Rather, they observed that "proper emphasis and attention are paid to them in much larger system of social psychological phenomena and concepts" (p. 543). This appears to be the case in agricultural education. Researchers in the profession will probably find themselves undertaking studies in attitude-related measures at an increasing rate.

McCracken (1970) in addressing the methodological weaknesses of survey research pointed out that major problems result from questionable reliability and validity of measurement instruments among many others. There is also the problem with the analytical procedures associated with attitude-related data (Fishbein and Ajzen, 1972). Furthermore, even when the measuring instrument has been determined to be highly valid and reliable the overall quality of the research is still questionable because of the high probability associated with drawing unwarranted or invalid conclusions due to the superficial or aberrant nature of the responses. Cook and Campbell (1979) identified the unreliability of measurement as one of the threats to statistical conclusion validity. Subsequently, they suggested the use of more aggregated units (e.g. group means instead of individual responses) to improve the reliability of results. This is an argument in support of ascertaining more homogeneous groups before data are analyzed.

Parenthetically, when data from attitudinal scales are analyzed using, say, mean ratings (judgements or responses) on some psychosocial or psychophysical object there may appear to be similarities across subgroups of the sample or even population of interest. In such studies the researcher usually concludes "no significant differences." However, empirical evidence exist to the contrary that similarity in appearance of response is, under greater scrutiny, usually underlain by significant differences with respect to confidence judgements. (Johnson 1940, 1941, 1945; Cronbach, 1946; Mitzel et al., 1956; Pollack and Decker, 1958; Ghiselli, 1963; Ebel, 1965; Converse, 1970; Jacobs, 1971; Echternacht et al., 1972; Waksberg, 1975; Sample and Warland, 1973; bin Yahya, et al. 1983.)

The need to search for improved ways of determining the existence or non-existence of true significant differences when measuring attitude-related concepts appears to be great. One approach to improving attitude measurement has been the certainty ratings of decisions or opinions (agreement, favorableness, willingness to act, etc.). Johnson (1945) argued that certainty is an important dimension of the judgement process. He noted that judgements may appear to be similar but may be made with varying degrees of confidence. Furthermore, he remarked that indication of confidence could range from a pure guess (or zero confidence) to absolute certainty (or 100% confidence). And as Converse (1970) pointed out, some people for some reason will oblige to try a response of opinion even when none really exists. Such individuals, he discovered usually respond in a manner indicative of a positive or negative position, a manner not different from that of individuals with well developed or strong attitudes. In order to collect more reliable data for analysis he suggested that such respondents be excluded from the researcher's study. In Saunders' (1956) study, a variable was used to help in the identification of such individuals. He called this variable a moderator variable while Ghiselli (1963) referred to it as a predictability variable.

According to Guion (1965) a moderator variable serves to predict individual error of measurement (judgement) by changing the kind and nature of relationship between two other variables. Researchers who use the moderator variable tend to increase the probability of selecting data from high-certainty respondents for further statistical analyses. In both conceptual and nomological contexts, this technique has great utility, for according to Upshaw (1962) an adequate theory of judgement (an attitude) should surely encompass all facets of the judge's reference scale. Thus, for example, not only are the opinions of respondents important but also the degree to which the respondents are confident of the expressed opinions is equally important for drawing valid statistical conclusions. Earlier, Hollingworth (1925) had contended that a judgement (opinion) could be defined in terms of confidence of the result.

Certainty rating of decisions seems to take different forms according to what is measured. Conceptually, the phenomenon is defined in the context of certainty or confidence of response, hence, the Certainty of Response Rating (CRR). A tentative definition of the technique is presented as: Soliciting the respondent's perceived level of confidence bearing on his/her judgement or decision on a social or psychological (i.e. attitude, belief, or behavior) phenomenon, concept, or object.

SOME EXAMPLES OF THE CRRT IN USE

The CRRT or its modified form has been used by Pollack and Decker (1958), Torrance and Aliotti (1965), Bertram and Pargament (1969), Rambo (1969), Converse (1970), Sample and Warland (1973), and bin Yahya, et al. (1983). Two of these studies are briefly presented to illustrate the primary function of the CRRT. Then, a third, the bin Yahya et al. (1983) study will be used to further elaborate the potential for the CRRT.

Before proceeding to these illustrations a brief statement of how the CRRT is employed in data collection is in order. Two steps are usually followed:

1. First, the respondent is instructed to respond to a statement or item related to some psychosocial or psychophysical object of interest using a Likert-type continuum. For example: an agree-disagree scale (binary or otherwise).
2. Then, for each response he/she is requested to indicate the level of confidence with which the judgement (or response) was made.

Figure 1 shows one page of the instrument used in the bin Yahya, Richardson, and Moore (1983) study. For each statement on the instrument the respondents were asked to indicate 1) their degree of agreement and 2) how certain they are of their degree of agreement. This is typical of the use of the CRRT.

In the Pollack and Decker (1958) study subjects were asked to indicate how positive they were that they heard words correctly. The researchers concluded that the technique produced a finer grain analysis of the respondents' discrimination continuum than that provided by their original scale which used only a binary system. In a study of attitudes and activities of students related to student government, Sample and Warland (1973) found both high and low-certainty groups had similar means but differed in standard deviations.

The bin Yahya, Richardson, and Moore Study

In 1982 these researchers conducted a study of agricultural teacher educators concerning their opinions on international agricultural and rural development. They used a questionnaire which had 10 sections with a total of 91 items on two separate scales juxtaposed to each other. The items were concerned with how rural life and agriculture could be improved in Third World nations. Each scale was on a 5-point continuum.

On the first scale, respondents were to indicate their degree of agreement ranging from "Strongly Disagree" to "Strongly Agree." Then they were to position their judgement on a certainty scale that ranged from "Not Very Certain" to "Very Certain" on the second scale. This was the same scale employed in the Sample and Warland (1973) Study.

Data for both scales were transformed from the original 5 points to 13 points using the certainty method of assigning values to responses as suggested by Warren et al. (1969). The basic assumption of this technique is that response values have unequal intervals therefore, tails of the original scale are spread out while the middle is pressed together. The teacher educators who participated in the research were placed in three groups and the data were analyzed accordingly. The three groups were:

Group I -- Teacher Educators with International Experience (N=55)
Group II -- Teacher Educators Who Desired International Experience (N=53)
Group III -- Teacher Educators Who Had No Interest in International Activities (N=56)

Even though it is inappropriate to use multiple F-tests (ANOVA on each of the items) in analyzing the data, the researchers performed these tests on 84 items in order to illustrate the possible merits of using the CRRT.

Statistically significant differences were found on 12 of the 84 opinion statements. Generally, the differences which existed in perception were between teacher educators with international experience and those who had no desire for such experience. Since there were no statistically significant differences on 72 of 84 items one might conclude there isn't really a difference in the views of the three groups of teacher educators. However, when we examine how certain each group was of their responses on the attitude statements, a significant number of differences is discovered. When F-tests were calculated on the certainty responses which accompanied each attitude statement, 52 statistically significant differences were found. There was a marked difference in how certain the three groups were of their responses. The conclusion which were reached by examining responses to the statements and those of the certainty scale were different from the conclusions which would have been drawn by examining responses to the attitude statements alone.

Five of the items from the bin Yahya, Richardson, and Moore Study are presented in Table 1 to illustrate how the CRRT aids in interpreting

Table 1

SAMPLE FINDINGS OF THE BIN YAHYA ET AL STUDY (1983)

	Degree of Agreement*			Certainty of Response*		
Statement	Educators with Inter. Experience	Educators Desiring Inter. Experience	Educators Not Desiring Inter. Experience	Educators with Inter. Experience	Educators Desiring Inter. Experience	Educators Not Desiring Inter. Experience
People on a poverty level can organize themselves into viable systems.	7.33	6.89	7.30	9.11$	9.00+	7.56$+
Developing countries need more all-weather roads, railroads, and waterways where feasible.	9.73	9.38	9.18	9.52$	9.94+	7.93$+
Developing countries should adopt the American Land-Grant College concept.	9.25	9.30	9.00	9.63$	9.90+	8.25$+
Agriculture in developing countries needs to be diversified.	8.82	8.42	8.64	9.33	8.68	7.75
People in developing countries are lazy.	4.49+	5.62	5.96+	9.22$+	8.08$	7.46+

*Range of possible score is 1-13 with 13 being the most positive.

Note: Similar symbols (+, $) indicate statistically significant differences in group mean ratings.

the findings. On the first four items there were no differences on the degree of agreement among the three groups. However, on the certainty scale there were statistically significant difference between teacher educators not desiring international experience and those who were experienced or desired experience.

On the last item there was a statistically significant difference between teacher educators with experience and those who did not desire experience. Those who desired no experience were more in agreement with the statement that people in developing countries were lazy than were the teacher educators who had experience; however, they were less certain of their views. This additional information gathered from the CRRT is valuable in interpreting these findings.

SOME THOUGHTS CONCERNING THE CRRT

The CRR scale or its modified form has been used in the field of psychology from where its conceptual and theoretical bases stem, and also in educational testing, sociology, and physics. In agricultural education it appears the only study that has so far employed the CRRT is the one by bin Yahya et al (1983). The CRRT appears to be a promising technique in agricultural education research. The CRRT appears to have four major functions. They are:

1. Moderating Function (bin Yahya, Richardson, and Moore. 1983; Day, 1970; Ghiselli, 1963; Guion, 1965; Johnson, 1945; Pollack and Decker, 1958; Sample and Warland, 1973): The CRRT serves as a moderator variable, which changes the kind and nature of relationship between two other variables.
2. Homogeneity Function (Johnson, 1945; Sample and Warland, 1973; Torrance and Aliotti, 1969): As a moderator variable, the CRRT serves to partition respondents into more homogenous groups for judgements may be similar in appearance but vary in the degree of confidence with which they are made.
3. Increased Validity and Reliability Function (Pollack and Decker, 1958; Converse, 1970; Sample and Warland, 1973): Partitioning respondents into high- and low- certainty groups is useful for interpreting research findings. Conclusions are made with a higher degree of confidence.
4. Correlational Function (Bertram and Pargament, 1969; Ghiselli, 1963; Pollack and Decker, 1958; Rambo, 1969; Sample and Warland, 1973; Torrance and Aliotti, 1965): In serving as a set of moderator variables certainty ratings help to improve on the initial correlations between predictor and criterion variables. This is achieved by partitioning respondents such that validity of the measures is high for one group but low for the other and using the former in the correlational analyses.

While the CRRT appears to have promise for improving attitudinal research in vocational education one should be aware of potential limitations. Four possible limitations have been identified by the authors. These are:

1. Definitional: Semantic differences as to the exact meaning of confidence, certainty, or surety are bound to arise. Conceptual confusion is a problem associated with nearly all other psychological and social phenomena and ideas. (Johnson, 1945; Hollingsworth, 1925)

2. Measurement Constraints: Certainty or confidence judgement is not ontologically different from attitude with respect to measurement. A subject asked to indicate his/her position on a certainty continuum is faced with no less problems as is the case with that subject who attempts to present the socially acceptable self (i.e. public, common, and measured opinions versus private and individual opinions). (Converse, 1970; Hesselbart, 1978; Kiesler and Munson, 1975).
3. Ratio of Response Variance (RRV): RRV refers to differences (about 15% to 20%) between responses to differentially worded statements related to the same attitude object (Waksberg, 1975). The methodological problem here is that it is equally likely that the confidence in response would vary from item to item. Consequently, a problem of data analysis could come to the fore as well.
4. The Problem of Sets: This issue is related to the measurement and RRV problems noted above. It is two-fold. There is a response set and a judgemental set (Rambo, 1969). The former operates when a subject formulates his/her response on the basis of item content and inter-item relationships. In the latter case he/she responds not on the basis of item-item comparisons but on a comparison of the stimulus item with her/his own position regarding the attitude domain of interest.

These issues are raised here to serve two purposes. First, this is to make the discussion complete -- a critical look at a tool with very great potential. Second, the reader is to be fully aware that several methodological problems could surface even before data analysis.

In summary, we wish to note that despite these possible limitations (albeit common to most, if not all, psychosocial and psychophysical concepts and their measurement), the CRRT has great promise for improving attitude measurement.

RECOMMENDATIONS

Attitude (opinions, perceptions, decisions, etc.) measurement appears to be one of the major areas of endeavor in vocational education research. Irrespective of the type of research design (experimental, quasi-experimental, or survey) collecting valid and reliable data is an essential and critical step in the research process. And one method of securing such data is to overstep the stage where respondents simply report whether or not they agree to or are in favor of some psychosocial or psychophysical object. Respondents should be allowed to express their own level of confidence on their judgements (decisions they make). This could be achieved using the CRRT, which appears to reveal the superficialty of similarity of responses when researchers rely exclusively on Likert-type scales.

It is suggested that researchers in agricultural education seriously consider the use of the CRRT as a complementary technique as they undertake attitude-related studies. The technique has served other disciplines, so why not the profession? Let the profession heed the criticism by Matthews and Campbell (1983) that vocational education (which includes agricultural education) research appears to be suffering from an ailment of isolation ..... isolation from the works in other academic disciplines. Is it? If it really has been, should it be?

In an attempt to share our experience with the research community in agricultural education, viz-a-viz the utility of the CRRT, it is our hope that some light has been thrown on this rather nebulous yet important area of research ..... attitude measurement. We may probably never know how many critical questions (presumably the right ones too) we might have evoked from among the members of the profession. However, we take solace in the belief that knowledge sharing is the hallmark of the scholar, and of course, the researcher. Ultimately, therefore, we believe that some of the obviously unquestioned data collection procedures in research are more detrimental to scholarship than the litany of unanswered questions bearing directly on research methodology.

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Applications of Microcomputers and Need for Computer Competency Development Perceived by New York State Agricultural Secondary and Postsecondary Instructors and Extension Agents

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INTRODUCTION

Microcomputer use in agricultural instructional programs was the January 1982 theme of the Agricultural Education Magazine. State and National level research, journal articles, and regional workshops have also called attention to a concern about the use of microcomputers in agricultural education nation wide. New York State microcomputer workshops and courses for agricultural secondary and post-secondary instructors and extension agents have been heavily attended. The courses and workshops have focused on what seemed to be the appropriate content given the lack of a research base.

Helgeson (1982) identified two basic uses of the microcomputer for educators as computer assisted instruction (CAI) and computer managed instruction (CMI). Applications of CAI include tutorial, drill and practice, instructional games, simulation, problem solving, data collection and analysis (Helgeson, 1982; Camp, 1983; Minnesota Educational Computer Consortiuum, 1980). Computer managed instruction includes record keeping, materials generation and data base use (Helgeson, 1982).

Competencies needed by agricultural educators to use microcomputers have been studied by Bowen (1983) and Hudson (1983). Both studies recommended that competency assessment be part of planning preservice and inservice education courses for agricultural educators.

Cantrel and Byler (1983) identified a need to explore types of delivery systems for inservicing agricultural teachers and extension educators about microcomputer use and for competency development. McGonigal (1983) provided findings about types of microcomputer inservice needed by New York Extension agents. However, the McGonigal study failed to identify the specific microcomputer competencies needed by New York agricultural extension agents, or to recommend a model for preservice and inservice programs. Moreover, an investigation of New York agricultural secondary and post-secondary teacher's use of microcomputers for instruction and the competencies needed to use the microcomputer has not been conducted.

Studies concerning microcomputers in agricultural instructional programs nationally and by state are limited in number and scope and have failed to address the post-secondary level. A study was needed in New York State on microcomputer use and educator microcomputer competencies needed at the secondary, post secondary and extension levels in order to plan preservice and inservice educational programs. A study of this nature could also have implications for use in other states.

OBJECTIVES

The purpose of this study was to design a preservice and inservice model for agricultural educators by identifying the instructional uses of microcomputers and the competencies needed to implement the technology in secondary, post secondary and extension level agricultural instructional programs. For secondary, post secondary and extension level agricultural instruction programs, the specific objectives were to:

1. Determine the microcomputer use in 1983-84.
2. Compare the extent to which categories of microcomputer use are similar among agriculture secondary teachers, post-secondary teachers, and extension agents.
3. Determine the importance of competencies needed to use microcomputer technology.
4. Compare the ratings of agriculture secondary and post-secondary teachers, and extension agents on competencies needed to use microcomputers.
5. Recommend preservice and inservice activities which are appropriate individually and collectively for the groups' agricultural secondary teachers, post-secondary teachers, and extension agents.

PROCEDURES

The instrument developed by Hudson (1983) provided the structure for a major section of the questionnaire for this research. After review and revision by the research staff, the questionnaire was reviewed for content validity by a panel of 16 experts including Cornell and New York Agricultural and Technical College instructors, agriculture teachers, extension agents, administrators and state supervisors, industry representatives, and personnel from the New York State Learning Technology Center. A final draft of the instrument was developed and field tested with a random sample of 36 agricultural educators with proportionally equal representation among the three groups being studied in this research. Reliability coefficients (Cronbachs Alpha) of .91 and .98 were established for the two different sections of the instruments.

The population of subgroups consisted of 333 secondary teachers, 151 post-secondary teachers, and 179 extension agents whose names were taken from directories developed by their respective agencies. The New York Agriculture Teachers Directory published by the New York State Education Department; Directory of Post-Secondary Agricultural Instructors, edited by Bruce Wright; and a Directory of Agricultural Extension Agents published by the Cornell Cooperative Extension Service were placed on a PFS data base management program using the Apple II+ microcomputer. Address labels were generated and a log of research activities were recorded.

A screening question was used at the beginning of the instrument to solicit responses only from agricultural educators who were microcomputer users. Hence, information was collected from the population of agricultural educators who were most likely to have the background and knowledge needed to respond to the questions, and who were willing to complete the questionnaire. Ninety-two agriculture teachers, 36 post-secondary teachers, and 97 extension agents met the criteria and responded to the survey which was 27.6, 23.8, and 54.2 percent of the total population for the categories of agricultural educators respectively. An initial follow-up letter and a second letter with a post card for requesting a duplicate questionnaire if the first one was lost encouraged response to the questionnaire.

An analysis of responses from post-secondary teacher and extension non-respondents showed no major differences between respondents and non-respondents. However, secondary teacher non-respondents were different in terms of being non-users of computers, and teaching in area occupational centers or in New York City.

The data were analyzed using SPSS version X computer program at Cornell University. The analyses were limited to descriptive statistics since the total population of microcomputer users was sampled.

FINDINGS

A Pearsons Product Correlation Coefficient was used to determine relationships among agricultural secondary teachers, post secondary teachers and extension agents ratings of competency development and use. Coefficient levels of very high (.70 to 1.0), high (.5 to .69), moderate (.30 to .49), and low (.00 to .29) were established a priori and used to interpret data in the findings section. Mean scores were used to rank microcomputer uses and the importance of the competencies to identify to most frequent users of microcomputers and the most important microcomputer competencies.

Instructional Uses of Microcomputers

Levels of computer assisted instruction (CAI) and computer managed instruction (CMI) use were rated on a 4 point likert scale in terms of their frequency of use in teaching (1=Never; 2=Seldom; 3=Occasionally; 4=Frequently).

Overall, agricultural educators rated "problem solving" highest ($\bar{x}$=2.25) and "educational games" lowest ($\bar{x}$=1.58) in terms of present instructional use. By groups, the highest and lowest rated categories of use were the same except that post secondary teachers rated "simulation" "first by one-hundredth of a point above" problem solving. Agricultural teachers' ratings of use in all categories were higher than those of post secondary and extension agricultural educators. Post secondary teachers rated three of five categories of use higher than extension agents. The mean score ratings indicated that the extent of instructional software use among the groups ranged from seldom to never. Pearsons correlation coefficients for the three possible comparisons between groups of two were at the low level.

Rankings for all three groups for CMI showed that "data base management" ($\bar{x}$=2.24) was most frequently used and "materials generation" ($\bar{x}$=1.85) was the least frequently used form of computer managed instruction. All categories of use fell in the range of "seldom" or "never" used. The most frequently used form of computer managed instruction by groups was "word processing" by secondary teachers ($\bar{x}$=2.12), "record keeping" by post secondary teachers ($\bar{x}$=2.55) and "data base management" by extension agents ($\bar{x}$=2.24). The correlation coefficient was low for ratings among groups in all cases.

Competencies Needed To Use Computers

Agriculture teachers, post secondary teachers and extension agents who currently use microcomputers in their instructional program were asked to rate on a four point likert type scale (1=No Importance; 2=Some Importance; 3=Important; 4=Essential) the importance of 51 competencies which were grouped in four sections. The four sections were "general competencies," "programming," "hardware," and "software."

The most important of 11 competencies under the heading "general" was "retrieve a program from a disk using a catalog/menu" as indicated by a composite mean score of 3.35. The least important competency was "performing maintenance on the microcomputer" ($\bar{x}$=1.88) which was the only competency below a mean score of 2.27 and was ranked last by all groups. All three groups ranked "identify the interfacing and networking opportunities in the community," and "demonstrate a positive non-fearful attitude toward microcomputers," first and second, respectively. Table 3 depicts mean score ratings of general microcomputer competencies for all groups. A majority of the 11 competencies in this category had a low correlation coefficient between the three groups. Moderate association (r=.49) was found between secondary teachers and extension agents on identifying "interfacing/networking opportunities in the community." Post secondary teachers and extension agents had moderate levels of association for "advise clients on microcomputer use" (r=.35), and "identify the interfacing/networking opportunities in the community" (r=.42).

Thirteen microcomputer competencies dealing with programming had mean scores between 1.53 and 2.46 when all three groups were averaged together. "Evaluate individually developed programs" ($\bar{x}$=2.17), "work with programmer to develop software" ($\bar{x}$=2.21), and "design a series of microcomputer applications that are relevant to the course of study" ($\bar{x}$=2.46) were the highest rated programming competencies and the only ones above 2.0. The highest rated competency, "design a series of computer applications relevant to the course of study" was rated highest by all three groups. The lowest rated competency was "program in a language other than BASIC" ($\bar{x}$=1.53), closely followed by "translate programs from one language to another" ($\bar{x}$=1.54). Table 3 portrays mean score ratings by agricultural educators on programming competencies. A low level of relationship was found between the three groups of agricultural educators for the 13 microcomputer programming competencies.

Thirteen competencies dealing with microcomputer hardware were rated by secondary teachers, post secondary teachers, and extension agents. The average for all subgroups of agricultural educators indicated "using the disk drive," "keyboard," and "printer" as the three highest rated competencies with mean scores of 3.29, 3.23, and 3.18, respectively. "Using the cassette recorder" and "graphics tablet" received mean score ratings of 2.07 and 2.11, respectively and were the lowest rated competencies. Table 3 displays mean score ratings of competencies by agricultural educators. The relationship among ratings by the three groups of agricultural educators was low except at a moderate level between secondary teachers and extension agents for the competencies "restoring the system to operation" (r=.30), and "communicating with other computers" (r=.51); and between post secondary and extension agents for the competency "communicating with other microcomputers" (r=.40).

For the 13 competencies dealing with software, all three groups collectively rated "identify software useful for instruction in agriculture" highest ($\bar{x}$=3.38). On the average, the "use of software to maintain student records" was the lowest rated competency; however, the range of mean score ratings among groups for this competency was considerable (2.96=secondary teachers; 2.5=post secondary teachers; and 1.77=extension agents). Four of the 13 competencies were rated "important" (3.0 and higher), including "identify software for instruction in agriculture," "identify software useful for agricultural industry/home applications," evaluate agricultural industry/home applications software, and "use software developed for agricultural industry/home applications." Table 3 provides mean score ratings and ranks for software microcomputer competencies. The relationship between ratings by the groups of agricultural educators was low.

Preservice and Inservice Microcomputer Curricula

Labels for mean scores concerning the importance of computer competencies to agricultural educators between 3.45 and 4.0; 2.45 and 3.44; 1.45 and 2.45; and below 1.44, were established as "essential/core," "important/core," "some importance/optional," and "not important," respectively.

Criteria used to define a preservice (Baccalaureate level) and an inservice microcomputer curriculum were determined by a panel of experts. The panel determined that competencies rated by all groups at the "Important/core" level or higher were appropriate for the undergraduate curriculum. Competencies rated by one or two but not all three groups of agricultural educators at the "Important/core" level or higher were considered "supplemental" to the core competencies and more appropriate for graduate or inservice education programs. Competencies rated as "some importance-optional" were judged appropriate for the inservice level but of secondary importance compared to the supplemental category.

Table 3 depicts the competencies by all agricultural educators and by groups for preservice and inservice education. In summary, 20 of 53 competencies were recommended for the core preservice curriculum, none of which concerned programming. As first priority at the inservice level, eight, three, and eight microcomputer competencies were recommended for development by secondary teachers, post secondary teachers and extension agents, respectively. As a secondary priority for the inservice level nineteen microcomputer competencies were recommended for development by all agricultural educators (secondary teachers, post secondary teachers, and extension agents).

CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations were drawn from the research findings. The reader is reminded that the sample was taken from New York agricultural secondary teachers, post secondary teachers and extension agents who use microcomputers in their instructional programs. Therefore, any generalizations must reflect this limitation.

Conclusions

1. The extent of microcomputer use among users is less in extension than secondary and post secondary levels.
2. The extent of microcomputer use among agricultural educators is higher in the management of instruction than in computer aided instruction.
3. At present computer aided instruction and computer managed instruction are seldom or never used by New York agricultural educators. It is recognized that many factors other than lack of teacher microcomputer competence may be related to lack of microcomputer use in agricultural educators, such as lack of hardware and software, poor quality software and other reasons.
4. Pearsons product moment correlation coefficients revealed low levels of relationships between the three groups of agricultural educators for each category of use.
5. When the uses of microcomputers were ranked from "frequently" to "never" using mean scores, some similarity of rankings among the three groups were noted. For example, seven of nine categories of use for CAI and CMI were equally ranked by at least two groups and two uses were ranked equally by all three groups.
6. Twenty competencies related to microcomputer use in agricultural education are important for teacher/extension agent job performance.
7. Eight or less competencies are important to one or two of the three groups of agricultural educators.

8. Nineteen competencies are of some importance to agricultural educators. However, no competencies were deemed "essential" or of "no importance" to agricultural educators.

9. There are, generally, low levels of association among agriculture secondary teachers, post secondary teachers, and extension agents perception of microcomputer use and the importance of possessing microcomputer competencies using Pearsons Product Moment Correlation Coefficient as a measure. However, similar uses and competencies can be observed between groups when mean scores are ranked and/or grouped by specific levels.

10. A set of core microcomputer competencies common to all groups of agricultural educators found in this research should be addressed in a course at the preservice level.

11. Agricultural educators currently on the job without computer training should develop computer competencies at both the preservice and inservice levels as identified in this research.

12. Competencies important to agricultural secondary teachers, post secondary teachers or extension agencies within their respective groups should be taught as an inservice or graduate level class or workshop. In addition, microcomputer competencies somewhat important to the job of an agricultural educator should be an optional part of an inservice program rather than taught at the preservice level.

13. Programming competencies are less important than hardware, software and general microcomputer competencies and should not be a major concern for agricultural educators in their preservice program. Hence, teachers need to develop skills in using software programs that are already written and identify the appropriate stategies for using them in their respective instructional areas.

14. In general, agriculture teachers perceived that they have a greater need for computer competence in all four major areas than extension agents or post secondary teachers.

Recommendations

1. The undergraduate course in instructional applications of microcomputers taught at Cornell University should be revised to encompass core competencies identified in this research.

2. Inservice efforts in secondary, post secondary and cooperative extension levels, should be developed to focus on (a) competencies which are important or of some importance to the respective subgroups and (b) core competencies needed by individuals who do not presently have a sufficient level of mastery.

3. Cornell University and other appropriate inservice delivery agencies should explore options for providing courses, workshops, and other offerings which could address the needs of agricultural educators collectively and by groups identified in this research.

4. Agricultural educators need to explore possible uses of the microcomputer and to implement the appropriate technology in their curriculum.

5. Factors such as teacher, school, and program characteristics which could affect microcomputer use should be explored to help explain the extent of microcomputer use in agricultural education. Many of the factors were explored in a parallel research project conducted at Cornell University in 1984. They should be combined with this research to develop/refine an inservice and preservice model for microcomputer competency development.

6. A research project similar to this one should be conducted periodically in the future for the purpose of monitoring the use of microcomputers in education and determine the need for preservice and inservice educational activities.

7. Instructional materials on the use of micrococomputers should be developed along with other strategies which could assist teachers in implementing the technology in their curriculum.

8. Preservice and inservice recommendations based on this research should be reviewed by educational and computer experts before developing a program.

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Table 1

Extent of Microcomputer Instructional Uses by Agricultural Educators

Instructional Uses	Ratings by Agricultural Educators							
	Secondary Teachers		Post Secondary Teachers		Extension Agents		All	
	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank
Problem Solving	3.46	1	2.25	2	2.05	1	2.25	1
Tutorial	2.19	2	1.79	4	1.95	2	2.02	2
Simulation	1.86	4	2.26	1	1.83	3	1.91	3
Drill and Practice	2.07	3	1.83	3	1.69	4	1.87	4
Educational Games	1.85	5	1.32	5	1.41	5	1.58	5

Note: 1 = Never 2 = Seldom 3 = Occasionally 4 - Frequently

Table 2

Extent of Microcomputer Management Use by Agricultural Educators

Instructional Management Categories	Ratings by Agricultural Educators							
	Secondary Teachers		Post Secondary Teachers		Extension Agents		All	
	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank
Data Base & Management	2.04	3	2.05	3	2.49	1	2.24	1
Word Processing	2.12	1	2.16	2	2.31	2	2.21	2
Record Keeping	2.09	2	2.55	1	1.91	3	2.09	3
Materials Generation	1.98	4	1.31	4	1.91	3	1.85	4

Note: 1 = Never 2 = Seldom 3 = Occasionally 4 = Frequently

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Table 3

Importance of Microcomputer Competencies
To Job Performance of Agricultural Educators
and Recommendations for Preservice and Inservice
Competency Development

Microcomputer Competencies	Ratings by Agricultural Educators								Curriculum Recommendations				
	Secondary Teachers		Post Secondary Teacher		Extension Agents		All		Preservice	Inservice			
									[a] Important (Core)	[b] Important (Supplemental)			[c] Somewhat Important (Optional)
	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank		S	PS	E	
General													
Retrieve a program from a disk using a catalog/menu	3.49	1	3.15	1	3.30	1	3.35	1	X				
Demonstrate a positive non-fearful towards microcomputers	3.1	2	3.05	2	3.16	2	3.14	2	X				
Use an operator's manual	3.09	3	3.05	2	3.03	4	3.06	3	X				
Describe the use of microcomputers	2.90	4	2.75	4	2.96	6	2.90	4	X				
Identify educational goals for using microcomputers	2.72	5	2.6	5	2.95	7	2.81	5	X				
Advise clients on microcomputer use	2.60	7	2.40	7	3.01	5	2.75	6		X		X	
Define microcomputer terminology	2.66	6	2.55	6	2.83	8	2.72	7	X				
Identify the interfacing/networking opportunities in the community (e.g., campus, extension service, banks, etc.)	2.17	9	2.25	8	3.06	3	[illegible]	8				X	
Advise clients on microcomputer selection	2.15	10	2.05	9	2.58	9	2.33	9				X	
Calculate the costs of microcomputer ownership	2.22	8	1.9	10	2.44	10	2.27	10					X
Perform maintenance of microcomputers	1.81	11	[illegible]	11	2.0	11	1.88	11					X
Programming													
Design a series of microcomputer applications that are relevant to the course of study	2.63	1	2.42	1	2.32	1	2.46	1		X			X
Work with programmer to develop software	2.21	4	2.68	2	2.06	2	2.21	2		X			X
Evaluate individually-developed programs	2.28	2	2.36	3	2.0	3	2.17	3					X
Describe the use of control statements	2.16	5	1.95	4	1.79	7	1.96	4					X
Program mathematical functions	2.07	6	1.94	5	1.87	6	1.96	5					X
Link programs together	1.92	8	1.84	7	1.96	4	1.92	6					X
Write a program using BASIC language	2.26	3	1.85	6	1.65	8	1.9	7					X
Develop a flow chart	1.86	9	1.80	10	1.93	5	1.88	8					X
Demonstrate debugging program	1.98	7	1.84	7	1.59	10	1.78	9					X
Design assignments which require progressively greater programming skills	1.86	9	1.84	7	1.51	12	1.70	10					X
Describe programming logic (algorithms)	1.64	11	1.75	11	1.61	9	1.64	11					X
Translate programs from one language to another	1.51	12	1.73	12	1.50	13	1.54	12					X
Program in a language other than BASIC	1.51	12	1.65	13	1.55	11	1.53	13					X

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Microcomputer Competencies	Ratings by Agricultural Educators								Curriculum Recommendations				
	Secondary Teachers		Post Secondary Teacher		Extension Agents		All		Preservice	Inservice			
									[a]Important (Core)	[b]Important (Supplemental)			[c]Somewhat Important (Optional)
	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank	$\bar{X}$	Rank		S	PS	E	
Hardware													
Use the disk drive	3.43	1	3.15	2	3.21	1	3.29	1	X				
Use the keyboard	3.26	2	3.21	1	3.20	2	3.23	2	X				
Use the printer	3.25	3	3.15	2	3.13	3	3.18	3	X				
Demonstrate the operation of microcomputers	3.15	4	3.05	4	3.13	3	3.12	4	X				
Restore the system to operation after detecting an error	2.77	5	2.57	6	2.83	6	2.77	5	X				
Select microcomputers for specific use	2.56	8	2.47	7	2.73	7	2.62	6	X				
Communicate with other computers (networking)	2.11	13	2.31	8	3.10	5	2.59					X	
Evaluate microcomputers for specific uses	2.67	6	2.31	8	2.61	8	2.59	8		X		X	
Use large monitor for instruction/presentations	2.48	9	2.73	5	2.25	11	2.41	9			X		
Describe the difference among brands and models of microcomputers	2.18	12	2.10	13	2.55	9	2.34	10				X	
Describe the operation of components of the microcomputers (e.g., RAM, CPU)	2.27	10	2.31	8	2.41	10	2.34	11					X
Arrange the microcomputers in the classroom	2.57	7	2.15	12	1.75	14	2.14	12		X			
Use the graphics tablet	2.0	14	2.26	11	2.16	12	2.11	13					X
Use the cassette recorder	2.21	11	2.0	14	1.98	13	2.07	14					X
Software													
Identify software useful for instruction in agriculture	3.49	1	3.30	1	3.31	1	3.38	1	X				
Identify software useful for agricultural industry/home applications	3.41	2	3.15	4	3.27	2	3.31	2	X				
Use software developed for agricultural industry/home applications	3.32	4	3.2	3	3.25	3	3.27	3	X				
Evaluate software developed for agricultural industry/home applications	3.26	6	3.05	5	3.1	4	3.16	4	X				
Evaluate software for instructional purposes	3.34	3	3.25	2	2.98	5	3.16	5	X				
Use software for different instructional purposes (i.e., simulation, drill and practice)	3.32	4	2.90	7	2.69	8	2.97	6	X				
Use the microcomputer as a wordprocessor	2.88	10	2.7	10	2.8	6	2.82	7	X				
Identify modifications needed in software	2.27	13	2,8	9	2.7	7	2.74	8	X				
Organize a microcomputer software library	3.0	7	2.3	13	2.63	9	2.73	9		X		X	
Describe and select options for purchase of multiple copies at reduced cost	2.73	11	2.89	8	2.38	11	2.6	10		X	X		
Evaluate student output from software	2.94	9	3.05	5	2.1	12	2.59	11		X	X		
Describe and follow copyright laws	2.48	12	2.45	12	2.46	10	2.46	12					X

Note: a = Ratings between 2.45 and 3.45 by secondary teachers, post secondary teachers and extension agents;
b = Ratings between 2.45 and 3.45 by sub-groups of agricultural educators as indicated;
c = Ratings between 1.45 and 2.44 by secondary teachers, post secondary teachers and extension agents.
S = Secondary agriculture teacher
PS = Post Secondary agriculture teacher
E = Agricultural extension agent
For Rating scale 1 = No Importance; 2 = Importance; 3 = Important; 4 = Essential

TEACHER PERCEPTION: FFA MEMBERSHIP WITH NON-ENROLLMENT IN VOCATIONAL AGRICULTURE COURSES

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INTRODUCTION

The FFA was formed and exists with the purpose of being an integral part of vocational agriculture. In 1950, the 81st Congress of the United States passed Public Law 740 which states in part, "The objects and purposes of the corporation (Future Farmers of America) shall be 1) to create, foster, and assist subsidiary chapters composed of students and former students of vocational agriculture in public schools ..." (1983 FFA Official Manual:68). This act is still in force and guides the policies of the National FFA regarding membership.

Classroom instruction in vocational agriculture, membership in the Future Farmers of America and a Supervised Occupational Experience Program are all considered integral parts of vocational education in agriculture. The ideal FFA member attends vocational agriculture classes, pursues a membership in the local FFA chapter plus is actively involved with a Supervised Occupational Experience Program; however, it seems that more and more of today's FFA members are not involved with all three activities.

Article V, Section B, Paragraph 2 of the Constitution of the Future Farmers of America states, "to retain membership during high school, the member must be enrolled in at least one vocational agriculture course during the school year and/or follow a planned course of study for an agricultural occupation which includes a supervised occupational experience program, the objective of which is establishment in an agricultural occupation." (1983 FFA Official Manual:58)

The "and/or" part of this paragraph which permits FFA membership for high school students without vocational agriculture class enrollment was included in the early 1970's with the primary justification of allowing FFA membership for students who, for various reasons, could not enroll in vocational agriculture.

Need for the Study

At the 55th National FFA Convention in 1982, in Kansas City, Missouri, an amendment to Article V, Section B, Paragraph 2 was proposed. The proposal was to eliminate the word "or" from the phrase "and/or". The result of the proposed amendment would require both enrollment in vocational agriculture and a supervised occupational experience program for a student to be eligible for FFA membership. The amendment was defeated.

According to Coleman Harris, Executive Secretary of the National FFA Organization, this defeat was totally unexpected. (Harris:1983) Due to the apparent strong feelings of the delegates at the 1982 National FFA Convention against changing this article of the constitution, it was decided by the National FFA Board of Directors that research was merited to determine what affect this constitutional change would have on membership nationwide. This study is a result of that decision. It should perhaps be noted that a second attempt to change this section of the constitution was in progress at the 1983 National FFA Convention but was deferred by the National Officers pending the research findings of this study.

In view of the second attempt (1983) to alter criteria for membership, it would appear there still exists those who believe this change would strengthen the organization.

PURPOSE AND OBJECTIVES

Purpose

The purpose of this study was to determine the extent to which FFA membership without enrollment in vocational agriculture courses occurred throughout chapters. The study also attempted to determine the impact a proposed change to Article V, Section B, Paragraph 2 of the National FFA Constitution would have on vocational agriculture programs and FFA membership.

Objectives

The specific objectives of this study were identified as follows:

1. To determine the extent to which current in-school FFA members are not simultaneously enrolled in a vocational agriculture course;
2. To determine the perceived circumstances/reasons for the high school FFA member not enrolling in a vocational agriculture course;
3. To determine the impact (on high school FFA membership and membership participation and opportunities) of a proposed constitutional change that would require vocational agriculture enrollment for FFA membership;
4. To determine what impact the FFA membership not enrolled in vocational agriculture has on the vocational agriculture teacher and program;

5. To determine how prospective changes in educational requirements, scheduling, etc., will affect high school enrollment in vocational agriculture/FFA.

PROCEDURES

Population and Sample

The population studied consisted of 8,447 FFA Chapters recognized by the National FFA Organization. Upon identifying 425 chapters representing a five percent random sample, an additional twenty-five chapters were selected for a pilot study.

Data and Instrumentation

The data were collected through a mail questionnaire. The questionnaire was developed through joint efforts of The University of Maryland's Agricultural and Extension Education Department personnel and reviewed by members of the National FFA Board of Directors Research Committee and by selected members of the National FFA Center staff. A pilot study was conducted to validate the survey instrument. Twenty five chapters, representative of the population, were mailed the survey instrument. Data were returned by 15 chapters (60%). After minor modifications, the final form of the questionnaire was printed.

One advisor for each chapter in the sample (425) was sent the questionnaire and a cover letter explaining the study. They were asked to complete the survey instrument as completely and honestly as possible. The first mailing was made in early November, 1983. A follow-up letter and a second questionnaire was sent approximately two weeks later to those who had not returned the questionnaire.

Returns

Two hundred and seventy three questionnaires were returned, of which 269 were useable. Two were eliminated because a vocational agriculture program was no longer offered at the school. The other two eliminated were completed by junior high schools, which were not part of this study. A return of 63.3% was deemed useable. The sample represented 46 out of a total of 53 states and provinces served by the National FFA Center. Returns were received from 42 states. Regional distribution was as follows: Eastern (20), Southern (73), Western (66) and Central (110).

Analysis

The returned data were analyzed with the Statistical Package for the Social Sciences (SPSS) program at The University of Maryland's Computer Science Center. Statistics untilized included: frequencies, means, percentages, cross-tabs and the chi-square tests of significance.

RESULTS

Findings

Findings presented are based on data obtained from 269 chapter advisor questionnaires and records of the National FFA Center. Beginning with general background information, the findings will be presented in accordance with the objectives of the study.

Data obtained to provide general background information on the population surveyed included: areas of instruction, length of classes, format of classes, when chapter meetings are held and predicted attendance of high school students in college programs.

The most common area of instruction was agricultural production followed by agricultural mechanics. In the Eastern Region, however, agricultural mechanics ranked first and agricultural production second. Other areas taught that respondents viewed as being outside of the subject matter areas provided by the researcher include: Fundamentals of Agriculture, Citrus Production, Animal Science, Agricultural Science, Aquaculture, Agricultural Cooperative Training, Home Maintenance, Groundskeeping, Horticultural Mechanics, Landscape and Nursery Production, Agricultural Economics, Conservation, and Horse Management.

When asked the length of a single period class in their school, the average time indicated was a 55 minute period. A single period class was found to range from: 20 minutes (a module) to 90 minutes.

The scheduling format of vocational agriculture classes was requested. The majority of vocational agriculture classes (67%) were found to be scheduled in a single period time frame. Twenty-five percent of the teachers indicated other combinations of class lengths. These combinations were a composite of three general categories provided by the author.

FFA chapter meetings are held both during school and after school. A wide variety of replies were received from the teachers when questioned about this subject. There did not seem to be any pattern to the times when FFA chapter meetings are held. Teachers reported having anywhere from 0% - 100% of chapter meetings during school or 0% - 100% of chapter meetings after school. The majority of teachers reported a combination of meeting times.

Expected enrollment of vocational agriculture students in post-secondary institutions was solicited. Reported data indicated that 3,234 students out of 17,997 are expected to attend a four year college and

3,947 students out of 17,997 are expected to attend a two year college. The figures were obtained by taking the estimate given by the teacher of the percent of students who will attend two year or four year college programs and multiplying it by the total vocational agriculture enrollment reported for the department.

Findings relative to Objective 1: To determine the extent to which current in-school FFA members are not simultaneously enrolled in a vocational agriculture course.

The extent to which current in-school FFA members are not enrolled in vocational agriculture classes is a major concern. An attempt was made to ascertain enrollment and membership data.

Based on the data obtained, the average size FFA chapter membership is 54 while the average vocational agriculture department is 67 students. The data indicates a trend of more students in the vocational agriculture classes than enrolled as members of the FFA. This trend was expected (based on the literature review), however, further scrutiny of the data also indicated high school FFA membership without concurrent vocational agriculture enrollment. The gap between vocational agriculture enrollment and FFA membership will be greater with occurrences of non-enrolled high school FFA members.

Thirty-eight chapters reported high school members in their FFA chapters that are not enrolled in vocational agriculture classes. This is 14% of the total chapters responding. Looking at the data geographically, FFA membership with non-enrollment in vocational agriculture is occurring in 19 out of the 42 states represented in the sample (45%). Tables 1, 2, and 3 further depict the occurrence of non-enrollment of FFA members in vocational agriculture. Table 1 reveals the distribution of cases throughout the FFA regions. Table 2 illustrates these occurrences according to states.

TABLE 1

Distribution Of FFA Chapters Reporting Non-Enrollment Of FFA Members In VOAG By FFA Regions

Region	Number Returns	Number Reporting Non-Enrollment	Percent of Total Cases
Eastern	20	2	5%
Southern	73	11	29%
Western	66	11	29%
Central	110	14	37%
TOTAL	269	38	100%

TABLE 2

Distribution Of Recorded Occurrences Of FFA Members Without Enrollment In VOAG

State	Number in Sample	Number of Reported Occurrences	Percent of State Occurrences	Percent of Total Occurrences
Alabama	6	1	17%	3%
Arizona	1	1	100%	3%
Connecticut	2	1	50%	3%
Florida	15	3	20%	8%
Georgia	11	2	18%	5%
Illinois	15	4	27%	11%
Indiana	9	1	11%	3%
Iowa	12	3	25%	8%
Kansas	3	2	67%	5%
Maryland	4	1	25%	3%
Minnesota	11	2	18%	5%
Nebraska	4	1	25%	3%
North Carolina	9	1	11%	3%
Oregon	2	1	50%	3%
South Carolina	2	1	50%	3%
Texas	27	9	33%	24%
Wisconsin	13	1	7%	3%
Washington	6	1	17%	3%
TOTAL	152	38		99%

Table 3 summarizes the occurrences according to grade levels. Although FFA members without concurrent vocational agriculture enrollment occurs at all grade levels, it seems to be somewhat more common at the upper grade levels (junior and senior).

It is believed that additional occurrences of FFA members without enrollment in vocational agriculture exist, however, the instrument failed to document the occurrence. Additional follow-up is recommended to further quantify existing conditions.

TABLE 3

Occurrences Of FFA Membership Without VOAG Enrollment
Grouped By High School Grade Level

		Grade Levels			
Region	Total	Senior	Junior	Sophomore	Freshmen
Eastern	2	2	2	1	2
Southern	11	10	8	6	1
Western	11	10	8	3	0
Central	14	10	9	4	1
TOTAL	38	32	27	14	4

Findings relative to Objective 2: To determine the types of circumstances/reasoning which hinder the high school FFA member from enrolling in a vocational agriculture courses.

Respondents were asked, "Do the students in your school have the opportunity to take free electives so that all students who wish to enroll in vocational agriculture classes can do so?" Ninety three percent reported students do have the opportunity to elect vocational agriculture and 7% reported students do not have this opportunity.

In response to the question, "Do courses in vocational agriculture qualify as electives fulfilling graduation requirements?", 97% reported vocational agriculture fulfills an elective graduation requirement while 3% report that is not the case in their school.

When asked, "With current conditions in your school, will vocational courses fit into a student's college preparatory program?", 85% indicated vocational courses do fit into college preparatory programs while 14% reported vocational agriculture courses do not.

Respondents were asked to agree or disagree with a battery of statements that presented plausible causes of non-enrollment in vocational agriculture by high school FFA members. Those responding with strongly agree or agree responses were placed in the agree category and those giving a strongly disagree or disagree response were grouped in the disagree category. Those that indicated undecided or no opinion were disregarded. Three statements received in excess of 50% agreement by those ressponding. In rank order, they are: 1) Students often need courses required for graduation which conflict with vocational agriculture courses. (78%) 2) Vocational agriculture courses routinely conflict with college prep courses. (56%) 3) Students leave vocational agriculture because they develop new or other interests outside of agriculture. (51%) See Table 4.

Findings relative to Objective 3: To determine the impact (on high school FFA membership and membership opportunities) of a proposed constitutional change that would require vocational enrollment for FFA membership.

Item 15 in the survey instrument indicated the National FFA Organization is considering a constitutional change that would have required a student to be enrolled in a vocational agriculture class and conduct a supervised occupational experience program in order to become and remain a FFA member in high school.

Respondents were asked if they felt the National FFA should adopt such a requirement. 55% supported adoption of such a requirement, 42% were opposed and 3% undecided. No significant difference was found among regions.

Those surveyed were then asked what might happen if the amendment does take effect. In answering, 1% reported chapter FFA membership would increase, 44% felt chapter membership would decrease and 54% stated chapter membership would be unaffected. One percent did not respond to the question. No significant difference between regions was found.

Findings relative to Objective 4: To determine what impact the FFA membership not enrolled in vocational agriculture has on the vocational agriculture teacher and program.

Teachers were asked to respond to the following three questions relative to their work with FFA members who are not currently enrolled in their vocational agriculture class(s):

1. "In your estimation, how much time do you spend working with FFA members who are not currently enrolled in your vocational agriculture class(s)?"
2. "Do you believe that it is your job to work with FFA members who are not enrolled in a vo-ag class?"
3. "Do you have any problems with the administration accepting your working with these students as part of your job?"

In response to question one, 56% of the teachers reported spending one to three hours per week with non-enrolled students.

In response to the second question, 74% indicated they believe working with the non-enrolled vocational agriculture student is a part of their job; while 20% did not believe this to be the case. Six percent were undecided. Significance among regions was not found.

In response to the last question, 85% of the teachers do not encounter problems with the administration accepting their working with the non-enrolled vocational agriculture students. Seven percent reported having problems with their administration. The Eastern region

TABLE 4

Possible Reasons Why Students Leave VOAG Classes

Statements of Reason	Teacher Response	
Students often need courses required for graduation which conflict with vocational agriculture courses.	Agree Disagree	78% 10%
Vocational agriculture courses routinely conflict with college prep courses.	Agree Disagree	56% 26%
Students leave VOAG because they develop new or other interests outside of agriculture.	Agree Disagree	51% 26%
Activities such as sports, band or chorus make it difficult for students to enroll in Vocational Agriculture.	Agree Disagree	45% 39%
Other vocational courses attract students away from vocational agriculture.	Agree Disagree	39% 42%
Students are advised not to take vocational agriculture.	Agree Disagree	22% 50%
The co-op program in school competes for vocational agriculture students.	Agree Disagree	22% 50%
Students leave VOAG because they have already taken all VOAG courses offered.	Agree Disagree	18% 69%

reported having the highest percentage with 10% of the teachers indicating they encounter problems with administrators. The Southern, Western, and Central regions reported 4%, 6%, and 8% respectively. No significant difference was found among regions.

Findings relative to Objective 5: To determine how prospective changes in educational requirements, scheduling, etc., will affect high school student enrollment in vocational agriculture/FFA.

Questions were asked focusing upon both increasing graduation requirements and increasing college entrance requirements. In response to the question, "Are the course requirements for graduation being increased in your school?", 83% of the teachers responded yes, 14% no, and 3% did not respond. A difference among regions significant at the .001 level, was recorded for this question. Of those indicating that graduation requirements are being increased, 46% felt that this action will reduce enrollment in vocational agriculture courses while 33% do not believe enrollment will be affected.

When asked, "Would the way your school handles the increasing requirements for college entrance (such as having a year of a foreign language), have any effect on vocational agriculture enrollments?" 62% responded in the affirmative. Thirty six percent said no and 2% did not respond. Those answering yes, were asked to provida their reasons. From those given, the author concluded increasing requirements will make it extremely difficult for students to enroll in vocational agriculture as an elective. Students may have to make a decision as to which course of study they wish to follow, vocational or academic.

CONCLUSIONS AND/OR RECOMMENDATIONS

Conclusions

The following conclusions are presented as they relate to the objectives set forth at the beginning of the study.

1. High school FFA membership without concurrent enrollment in vocational agriculture does exist. Fourteen percent (38) of the chapters who returned the questionnaire, reported having current in-school FFA members who were not enrolled in vocational agriculture. The distribution of these chapters regionally are 5% (2) in the Eastern region, 29% (11) in the Southern region, 29% (11) in the Western region and 37% (14) in the Central region.
2. The circumstances/reasons most frequently given for the occurrence of high school FFA membership without enrollment in vocational agriculture courses are: (a) scheduling conflicts and (b) students develop other interests outside of agriculture.
3. A change in the constitution to require vocational agriculture enrollment for FFA membership would appear to have a varied impact on chapter membership. Of those responding, 1% (3) predicted an increase in chapter membership, 44% (117) predicted a decrease and 54% (146) no appreciable change. Teacher support was also varied. Fifty five percent (149) would support a constitutional change requiring enrollment in vocational

agriculture for membership in FFA. Forty two percent (113) would not support such a change and 3% (7) were undecided.

4. Vocational agriculture teachers/chapter advisors do spend time working with FFA members not enrolled in vocational agriculture classes. Fifty six percent (151) reported spending between one to three hours per week with non-enrolled FFA members. Seventy four percent (199) indicated it was part of their job to assist these students.
5. There are situtations or circumstances that prevent high school FFA members from enrolling in vocational agriculture courses. Those found in the study tend to fall into two general categories: increased requirements and decreased flexibility for college bound students; and a nationwide trend to increase academic requirements for all high school graduates.

Implications

High school systems appear to be directing students to declare themselves as either college bound, vocational or general. The scheduling systems found in high schools do not appear to provide flexibility for students to take courses outside their own "track". Inflexibility in the curriculum of high school students has grave implications for vocational agriculture and the FFA. There may be an increasing trend for college bound agriculture students to forego vocational agriculture classes. A constitutional change to require vocational agriculture enrollment for continuing membership of high school students in FFA would mean the college bound student would also have to give up their affiliation with the FFA. With the general trend of college preparatory programs and scheduling in the high schools, we may expect to find a decrease in the vocational agriculture class enrollments and FFA by college bound students. What effect will these circumstances have on a college bound student's decision to major in agriculture and more specifically agricultural education?

In reviewing data implying a trend to increase academic requirements for high school graduation, it appears that students have less opportunity to select electives. Students appear limited in what they can choose and often are required to decide between a vocational course and an academic course required for graduation. The scheduling of academic courses opposite vocational agriculture courses also creates conflicts for non-college bound students resulting in non-enrollment with continuing membership in the FFA.

Knowledge of these occurrences, and reasons and circumstances of students is salient to everyone involved in agricultural education. In view of the findings and suggested implications of this study, the future of vocational agriculture and the FFA will require carefully planned program changes. Modifications must maximize the effectiveness of the program given the many constraints being placed upon it by changes in general and college preparatory education.

Recommendations

In furthering this research, the author offers the following recommendations.

1. Distribute the findings of this study to National FFA Officials, the National FFA Officer team, State FFA personnel, and the local chapters especially those who participated in the study.
2. Develop, administer and analyze an FFA Member Questionnaire, in the very near future, to further support or reject the findings of this study.
3. Survey state staff to determine what effect, if any, FFA membership without concurrent vocational agriculture enrollment has on state FFA personnel.

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CRITIQUE

IMPROVING ATTITUDE-RELATED MEASURES IN AGRICULTURAL EDUCATION RESEARCH: THE CERTAINTY OF RESPONSE RATING TECHNIQUE

by

Ismail bin Yahya and Gary E. Moore
Louisiana State University

APPLICATIONS OF MICROCOMPUTERS AND NEED FOR COMPUTER COMPETENCIES DEVELOPMENT AS PERCEIVED BY NEW YORK STATE AGRICULTURAL SECONDARY AND POST-SECONDARY INSTRUCTORS AND EXTENSION AGENTS

by

Dean Sutphin
Cornell University

TEACHER PERCEPTION: FFA MEMBERSHIP WITH NON-ENROLLMENT IN VOCATIONAL AGRICULTURE COURSES

by

Regina A.Smick and Ronald J. Seibel
University of Maryland

CONCURRENT SESSION I, 1:00-2:30 p.m.

National Agricultural Education Research Meeting
American Vocational Association
New Orleans, Louisiana

Discussant

Gary W. Leske
Associate Professor
Division of Agricultural Education
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IMPROVING ATTITUDE-RELATED MEASURES IN AGRICULTURAL EDUCATION RESEARCH: THE CERTAINTY OF RESPONSE RATING TECHNIQUE

Ismail bin Yahya and Gary E. Moore
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This paper is to be praised for the purpose it addresses--sharing the idea that soliciting respondents' level of confidence ratings on psychosocial variables is a necessary additional step to improving attitude-related measures in agricultural education research. It also is refreshing to see an objective focused upon conceptual and theoretical bases.

I have found it difficult to critique this paper because I have limited familiarity with the related literature. Consequently, I will focus on the questions that I encountered while reading the paper.

1. If our attitude-related studies are plagued with conceptual ambiguity, lack of common definitional bases, and questionable measuring devices, why not encourage the profession to clarify concepts and definitions instead of worrying about the precision of our measuring devices?

I hope that we strengthen our disciplined inquiry by adding tools in addition to quantitative methods. The authors appear to support this concern when they state "even when the measuring instrument has been determined to be highly valid and reliable the overall quality of the research is still questionable because of the high probability associated with drawing unwarranted or invalid conclusions due to the superficial or aberrant nature of the responses."

2. Why do the authors suggest that we in agricultural education will increase the proportion of our studies involving attitude related measures?

3. The discussion of the conceptual-theoretical base for Certainty of Response Rating Scale (CRRS) approach referred to as CRRT left me with a number of concerns.

First, why is most of the literature cited from the early 70's or older? For example, Ebel's work in 1965 does not reflect his lost enthusiasm for the certainty method. Ebel (1972) later said:

> Confidence weighting can affect both the reliability and the validity of the test scores. It is intended to improve both. But experimental studies of its affect on validity have given conflicting results. Some indications are that it helps substantially, others that it does little good. Significant validity studies are so difficult to design and carry out that few if any have been reported.... An examinee's uncertainty about his certainty may introduce almost as much error into his score as the reduction of guessing can remove. In any case, the present state of our knowledge about confidence weighting does not justify a recommendation that it be used routinely in classroom testing.

Second, the argument for the relationship between attitudes and certainty is conceptual. A definition of the concept of attitude would provide a useful mind set and raise the point that measurement of attitude requires a statement of positive or negative bias. The argument for the value of CRRT appears rooted in the strength of a person's bias versus openmindedness or indecision. The researchers are making the case for the argument that those of definite opinion provide the best information. I would have appreciated hearing the argument which finds openmindedness or lack of certainty a negative characteristic and demonstrates its association with less valid conclusions. The latter point is implied in the moderator variable literature cited, but not demonstrated.

In addition, a conceptual definition of attitude might have raised the point that cognitive attitudes are related to knowledge. The difference between cognitive attitudes and knowledge is primarily the degree of acceptance and ease of proof. If in a person's mind most informed persons regard a proposition as true, the proposition becomes part of one's knowledge, when there is significant difference of opinion one's personal position is an attitude. Certainty appears to be an appropriate label for quantification of information that locates a proposition on a continuum including attitudes and knowledge. The data in Table 1 appears to reflect this quantity of information. If one accepts the assumption that educators not desiring international experience have spent less effort in obtaining information relative to the international scene than educators who have been involved, the certainty of response means in Table I are in the order of magnitude expected: experienced-highest and not desiring-lowest. The question this raises is "Why not provide a response alternative, 'I do not have enough information to formulate a firm opinion' in addition to the undecided response?" The Converse citation implies this might not be functional because people feel compelled to respond, but the instructions provided might neutralize this predisposition. The not enough information response would have the potential to provide additional information regarding the potential need for information relative to the propositions of concern. There would appear to be a logical argument that the reliability and validity would be improved if persons of limited knowledge were simply eliminated.

4. The bin Yahya, Richardson, and Moore study discussion also left questions. First, the transformation of the 5 point scale to a 13 point scale using the certainty method of assigning values did not specify equivalent values. Reading the Warren et al reference, one finds the rationale but not the values assigned.

Second, how were the conclusions drawn after consideration of the certainty scale responses different than those drawn from attitude responses only? It was frustrating to not be able to react to the significance and impact of the additional information on conclusions drawn. The practical significance was not demonstrated. We are left to accept the researcher's opinion of the value of CRRT in drawing conclusions.

Finally, I have two application questions. First, does the certainty of response rating procedure rationale which sorts out the uncertain, perhaps less informed, lead to the conclusion that a panel of experts would provide more reliable and valid data? The Catch-22 appears to be how far does one sort the respondents before the risk of ignoring the reality that attitudes of the majority often guide what happens in the real world. How refined must attitude measures be?

Second, what impact does the certainty of response rating technique have on the persons completing the instrument? It obviously requires more mental effort. Is there a fatique effect which suggests a maximum number of items per instrument? Does the literature speak to the application questions?

In summary, I wish to thank the authors for challenging the profession to consider using CRRT and attempting a nearly impossible task in a 12 page paper. I found the paper enlightening and believe with certainty that I now have a better understanding of CRRT.

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APPLICATIONS OF MICROCOMPUTERS AND NEED FOR COMPUTER COMPETENCIES DEVELOPMENT AS PERCEIVED BY NEW YORK STATE AGRICULTURAL SECONDARY AND POSTSECONDARY INSTRUCTORS AND EXTENSION AGENTS

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The researcher is to be commended for studying the timely topic of preservice and inservice education relative to micro-computers. The specification of the importance of microcomputer competencies by in-service New York agricultural educator micro-computer users and the use of this information in curriculum development will add face validity to the instructional offerings in New York. It also has potential impact in other agricultural education programs.

Numerous strengths of this study merit acknowledgement and discussion such as utilization of the Hudson instrument in developing the questionnaire, content validation by a panel of experts, field testing the questionnaire, follow-up of non-respondents, and conclusions supported by the findings. But for the sake of brevity, I will focus on concerns.

CONCERNS

Recognizing the constraints on paper length, the literature cited is primarily agricultural education based. The relevant body of literature not bounded by agricultural education is extensive. Was it considered in identifying competencies?

The unique definition of the concept computer managed instruction utilized in this study (record keeping, materials generation, data base use, word processing) may confuse the reader familiar with typical computer terminology. The title for Table 2 provides an accurate definition, "micro-computer management use."

Reliability coefficients were established for two different sections of the field test instrument. Which sections? Why only two sections? More complete information on reliability will strengthen the study.

The paper I received did not reference Tables 1 and 2. This made the discussion of findings vague on first reading.

The findings and conclusions indicate that at present computer aided instruction and "computer managed instruction" are seldom or never used by New York agricultural educators who identified themselves as users. What does this mean? I propose that the Likert scaling for frequency of use was clean and easy to use, but sterile. What does it mean to say seldom or occasionally? Why not ask for frequency of use responses in a selected time frame, numerically define frequencies categories and present the findings?

The process and rationale used in labeling the categories used to group mean scores of importance for the computer competencies (essential/core, important/core, some importance/optional, and not important) was not clear. How did the researcher pick the number ranges and define the categories. Did the panel of experts participate in this process?

The process that the panel of experts used to determine that competencies which fell within the range of core-all groups should be in the pre-service instruction was not clear. Did they simply agree or disagree with the researcher's groupings within established categories (the sorting out)? Did they have the option of moving "core-all" groups competencies to the inservice time frame, and so on?

I encounter difficulties using the category decision rules. My attempt to follow them from Table 3 to Table 4 with the competence, describe and follow copyright laws, suggested the "optional all groups" category was not correct on Table 4.

The identification of Table 4 as the model designed as a result of this research, the product specified in the purpose statement, will help readers.

In view of the researchers' apparent assumption that microcomputers should be used in agricultural education, I am concerned about potential conclusions and recommendations not presented.

Proposed conclusion: the vast majority of New York vocational agriculture instructors (72.4% or more) do not classify themselves as microcomputer users. Recommendations 5, "other factors which potentially affect microcomputer use should be investigated", may parallel my proposed recommendation: cost-benefit analysis relative to microcomputer use should be undertaken. Since the identified users "seldom or never use," should we not be cautious in our advocacy? Or positively stated, what are the facts which will convince the potential user -- beyond keeping up with the technocrats?

Proposed conclusion: ethical questions may not be addressed when users importance ratings are used to establish curriculum content. granting problems of reliability of measurement relative to the statement, "describe and follow copyright laws" and potential confusion in categorization noted earlier, ethical character alone demands consideration of copyright laws in preservice education, not treatment as an option during in-service education. Remaining silent on this issue has implications that should be examined.

TEACHER PERCEPTION: FFA MEMBERSHIP WITH NON-ENROLLMENT IN VOCATIONAL AGRICULTURE COURSES

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The information provided by the research effort documents numerous facts relative to FFA membership and vocational agriculture. The results provide a national perspective and appear consistent with commonly held expectations. The implications section drew upon the conclusions in an effective manner. The paper was written in a style that was easy to read and effective. The design was appropriate.

Before I raise questions that I have concerning the authors' work, I feel compelled to reflect on our professional ideology. To paraphrase the authors, with some editorial license, the ideal vocational agriculture student is one who is enrolled in class, has SOEP and pays FFA dues (pursues a membership). Are the ultimate objectives of vocational agriculture achieved most efficiently and effectively by legislatively mandating all students be in the ideal category? How do we justify out-of-school active membership if we do not allow it for in-school students? If FFA is a democratic student organization developing leaders, should members not be given the opportunity to practice leadership in handling the potential or real problems of non-enrollment FFA membership?

Now back to the paper, items of concern:

1. Explanation of the rationale for selecting a five percent random sample of chapters would help the reader.

2. The questionnaire validation process is not clear. Did the pilot study group simply complete the instrument or critique it? If they critiqued it, were they aware of the objectives of the study?

3. Was consideration given to contacting non-respondents? Granting monetary constraints, it certainly would be desirable to know if non-respondent chapters had non-enrollment FFA member statistics similar to those of the respondents.

4. If the average FFA chapter has 54 members and the average vocational agriculture programs enrolls 67 students, is the non-enrolled FFA member issue the most significant problem?

5. The focus of Tables 1, 2 and 3 is on chapters with non-enrollment, not numbers of members not enrolled. The number of members involved is critical to evaluation of the problem. Unfortunately, the instrument does not appear to have gathered non-enrolled members numbers.

6. The questions designed to evaluate non-enrollment students impact on teachers and program, may be flawed. They do not separate out-of-school members and in-school non-enrolled members impact. I would be surprised if these items were interpreted in the manner that I have assumed was intended.

ALTERNATE PAPERS

AN ANALYSIS OF RESEARCH METHODOLOGY REPORTED IN AGRICULTURAL EDUCATION, 1974-1982

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INTRODUCTION

The initiation, establishment, and progress of any educational effort depends largely on the quality and quantity of the research and development base that supports it. The agricultural education profession has a long history and tradition of research and development support. The profession has always depended on research to chart its course. Summaries of research completed have been compiled since the early days of the profession (1935).

In recent years, however, concern has been expressed regarding the type of research being conducted and its impact. Periodically, professionals in agricultural education have questioned whether or not the type of research being conducted is meeting the needs of the profession and providing direction for further program development. Krebs (1976), speaking at the Thirtieth Annual Central Region Research Conference in Agricultural Education, observed that others outside the field of agricultural education characterize agricultural education research, among other things, as being "dominated by surveys."

Earlier, professionals in agricultural education were taking positive steps toward improving the visibility, status and quality of research conducted. In 1974, the First Annual National Agricultural Education Research Meeting was held in New Orleans, Louisiana. In December, 1983, the Tenth Annual Research Meeting was held. Attendance at the 1983 meeting was more than five times the number present at the first national meeting. During the ten year time period, efforts were made to increase the quantity of research conducted, to increase the quality of research reported, and in more recent years, to include a research training session as part of the meeting.

Others, too, have attempted to increase the effectiveness and impact of agricultural education research. Richardson, Shinn, and Stewart (1976,1977), involved the profession in identifying the "concerns" of the profession. It was hoped that by identifying the professional concerns of agricultural educators, research could be focussed to answer questions regarding the concerns. Mannebach (1978, 1980), conducted an analysis of the impact of agricultural education research on identified professional concerns. He concluded that 28 percent of the studies reported from 1974-1977 were "nonapplicable" to the professional concerns identified; 25 percent had implications for the first priority concern, curriculum development; and that 52 percent of the studies reported had impact on the first five areas of priority concern: curriculum development, funding, teacher shortage, teacher education and evaluation.

In another effort to improve agricultural education research, McCracken (1982), reviewed 61 research studies in agricultural education. From his analysis, four studies were selected as exemplary. Included were an experimental study exhibiting an exemplary procedure for establishing the creditability of instruments, a quasi-experimental study on teacher effectiveness, a philosophically sound follow-up study, and a developmental study that has had great impact upon the practice of college teaching.

Each of these efforts has been conducted to increase the effectiveness and quality of agricultural education research. Research in agricultural education has been and continues to be a concern of the profession. However, heretofore, no study known to the authors has been conducted to analyze the research methodology used in agricultural education. Is the observation by others as perceived by Krebs that agricultural education research is being "dominated by surveys" valid? What type of research is being conducted by the agricultural education profession? What research methods are being used? How are the data being collected? These and other questions regarding the issue of research methodology reported in agricultural education were the chief concerns of the study.

OBJECTIVES OF THE STUDY

The primary purpose of the study was to analyze the research methodology reported in agricultural education studies reported in the annual national Summaries of Research and Development Activities in Agricultural Education, 1974-1982. Specifically, the objectives of the study were:

1. To determine the broad trends in research methodology reported in agricultural education.
2. To determine the trends regarding the number of masters, doctoral and staff studies completed during the time period.
3. To identify by region and by institution where the majority of reported agricultural education research is being conducted.
4. To classify the research reported as historical, descriptive or experimental as classified by Van Dalen (1966).
5. To identify the primary manner in which the data were collected.
6. To identify the extent to which various statistical analysis tests and techniques were used and reported.

PROCEDURE

The primary method used in the study was document analysis. Abstracts of research reported in the annual Summaries of Research and Development Activities in Agricultural Education were reviewed by two graduate research assistants. Eight national summaries, from 1974-75 to 1981-82, were included in the study. No attempt was made to identify or analyze agricultural education research not reported in the Summaries. Pertinent data and information related to the objectives specified in the study were identified and coded on summary data sheets by the research assistants. The research summaries reported were classified as historical, descriptive or experimental according to criteria specified by Van Dalen (1966). Categories of other data collected were identified by the authors.

In order to determine the accuracy of coding, a portion of all studies coded was recoded by the principal author. A systematic random sample of five percent of the total studies was taken. These studies were then coded and matched with the previous coding to determine interrater reliability. The percentage of agreement between the coders and the principal author was 94 percent. It was therefore concluded that the coding was both accurate and reliable.

The data were analyzed by using techniques identified in the Statistical Package for the Social Sciences (1970). Descriptive statistics and cross-tabulation were used to determine the extent and relationship between types of studies reported and research methodologies used.

RESULTS

As shown by the data in Table 1, a total of 1,150 studies were reported during the eight year period studied. The smallest number of studies reported was 54 in 1974-75, the first year the studies were again compiled on a national basis. The largest number of studies reported was in the 1979-80 year. Since that time, the total number of studies reported has declined.

Of the 1,150 studies reported during the eight year period, 558 or 48.6 percent were masters studies, 342 (29.7 percent), were doctoral studies, 249 (21.7 percent), were staff studies, and one was an undergraduate honors thesis. The data show that the largest number of masters studies reported was 92 and 91 in 1975-76 and 1980-81 respectively. Doctoral research increased to a peak of 65 studies reported in 1979-80. Staff research reached a high of 52 studies reported in 1978-79. Staff research reported has decreased markedly since that time and in 1981-82, 22 staff studies were reported.

The institutions in states reporting agricultural education research were classified into regional designations as specified by Moore (1982) in the constitution and by-laws of the American Association of Teacher Educators in Agriculture. The central region reported the largest number of studies conducted. A total of 497 studies (43.2 percent) of the studies were from the central region. The southern region reported 296, (25.7 percent); the eastern region reported 219 (19.0 percent) of the studies while 135 (11.8 percent) of the studies were reported by institutions located in the western region.

TABLE 1

NUMBER OF MASTERS, DOCTORAL AND STAFF STUDIES REPORTED BY BY YEAR AND TOTAL NUMBER AND PERCENTAGE OF STUDIES REPORTED BY YEAR AND BY TYPE, 1974-1982

	Number of Studies Reported			Total	
Year	Masters	Doctoral	Staff	Number	Percent
1974-75	23	11	20	54	4.7
1975-76	92	52	24	168	14.6
1976-77	63	31	27	121	10.5
1977-78	49	57	35	141	12.3
1978-79	78	35	52	165	14.4
1979-80	79	65	36	181*	15.7
1980-81	91	45	33	169	14.7
1981-82	83	46	22	151	13.1
Total Number	558	342	249	1,150	100.0
Total Percent	48.6	29.7	21.7	100.0	

* One undergraduate honors thesis was reported during this year.

A total of 96 institutions having teacher education programs in agriculture were included in the study. The 1983-84 Directory of Agricultural Teacher Educators, distributed by the U. S. Department of Education, Washington, D. C., was the source of the institutions included. Fifty of the 96, or 52 percent of the institutions reported research during the eight year period. Three institutions, Ohio State, Oklahoma State and Pennsylvania State reported 35.6 percent, or over one-third of the research reported. Over half of the research reported was conducted by six institutions while two-thirds of the research reported in agricultural education was conducted by eleven institutions. Forty-six of the 96 institutions did not report any research conducted over the eight year period. One institution, the Ohio State University, reported 172 studies during the time period studied.

A question of whether or not the research reported was funded was raised in the study. Less than one percent of the studies clearly stated that they received funding. In most cases, the source of funding, if any, was not identified.

Another question studied was whether or not the data were collected in a foreign country. Studies which indicated that the data were collected outside of the United States were classified as foreign studies. Almost nine percent of the studies were foreign while data in over 91 percent of the cases were classified as being domestic studies.

A breakdown of the types of research studies reported by level of study can be found in Table 2. A total of 1,034 studies, or 90 percent of the studies reported were classified as descriptive studies. A total of 107 studies, or 9.4 percent were experimental and 8, or .7 percent, were historical studies.

TABLE 2

NUMBER OF PERCENTAGE OF MASTERS, DOCTORAL, AND STAFF STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Level of Study	Type of Study Historical						Total	
	Historical		Descriptive		Experimental		Total	
	Number	%	Number	%	Number	%	Number	%
Masters	5	0.4	511	44.5	42	3.7	558	48.6
Doctoral	1	0.1	293	25.5	47	4.1	341	29.7
Staff	2	0.2	230	20.0	18	1.6	250	21.8
TOTAL	8	0.7	1,034	90.0	107	9.4	1,149	100.0

Data in Table 2 also presents a description of the number and percent of historical, descriptive, and experimental research reported by level. A total of 44.5 percent of the masters studies, 25.5 percent of the doctoral studies and 20.0 percent of the staff studies were judged as descriptive, while 3.7 percent of the masters studies, 4.1 percent of the doctoral studies and 1.6 percent of the staff studies were experimental. Historical studies accounted for less than one percent of the research conducted.

The descriptive research studies reported were analyzed to determine whether they were survey, interrelationship or developmental studies as classified by Van Dalen. A total of 45 percent of the studies were classified as survey studies.

While Krebs may have been correct in his perception that agricultural education research was viewed by others as being "dominated by surveys," an analysis of the actual research reported more accurately reveals that 55 percent of the research is non survey research. As revealed by the data, the field of agricultural education research is in reality dominated by descriptive research. Ninety percent of the research reported was classified as descriptive research.

The number and percentage of surveys reported by type can be found in Table 3. School surveys were the dominant type of survey used with a total of 302, or 26.3 being reported. Job analysis, 7.0 percent; documentary analysis, 4.8 percent; public opinion, 3.1 percent; and community surveys, 3.7 percent comprised the remaining types of surveys used. A total of 633, or 55 percent of the studies classified were judged as not using the survey as the major classification of descriptive research reported.

TABLE 3

NUMBER AND PERCENTAGE OF SURVEY RESEARCH STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Type of Survey	Studies Reported Number	Studies Reported Percent
School	302	26.3
Job Analysis	81	7.0
Documentary Analysis	55	4.8
Public Opinion	36	3.1
Community	43	3.7
Not a Survey	633	55.0
Total	1,150	100.0

Data in Table 4 show the number and percentage of interrelationship studies reported by type. Overall, 13 percent of the studies were classified as interrelationship studies. Causal comparative studies comprised 8.1 percent, correlational studies made up 4.2 percent and case studies comprised less than one percent of the interrelationship studies reported.

TABLE 4

NUMBER AND PERCENTAGE OF INTERRELATIONSHIP STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Type of Interrelationship Study	Studies Reported Number	Studies Reported Percent
Causal Comparative	93	8.1
Correlational	48	4.2
Case Study	9	0.8
Not an Interrelationship Study	1,000	87.0
TOTAL	1,150	100.0

The third type of descriptive research classified by Van Dalen was developmental. Developmental studies comprised less than five percent of the research reported. A total of 51 studies were classified as being developmental studies; 40 or 3.5 percent were growth studies while 11 or one percent were trend studies. The data are presented in Table 5.

TABLE 5

NUMBER AND PERCENTAGE OF DEVELOPMENTAL STUDIES REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Type of Developmental Study	Studies Reported	
	Number	Percent
Growth	40	3.5
Trend	11	1.0
Not a Developmental Study	1,099	95.6
TOTAL	1,150	100.0

Another objective of the study was to determine the primary manner in which the data in agricultural education research were collected. Four methods of data collection as specified by Van Dalen were studied. Data collection methods used were questionnaires, interviews, appraisal instruments, and observation.

Data in Table 6 show the number and percentage of studies reporting the four primary data collection procedures used. The number and percentage of techniques used in sub-categories under the major data collection procedures reported are also shown.

As can be seen from the data, a total of 626, or 54.4 percent, of the studies reported that questionnaires were used to collect data. Very little data was reported regarding the type of questionnaire used. The mailed questionnaire was reported used by 3.6 percent of the researchers, direct contact by .5 percent, a closed form questionnaire by 1.5 percent and an open ended questionnaire by .4 percent of the respondents. The questionnaire was the primary procedure reported as being used to collect data in the agricultural education research studies reported.

A total of 165, or 14.3 percent, of the studies indicated that the interview was used to collect data. The individual interview was used in 10.9 percent of the cases while the group interview was used 1.8 percent of the time. Structured and unstructured interview procedures were reported as being used .3 and .1 percent of the time respectively.

The use of an appraisal instrument was reported by 214, or 18.6 percent of the researchers submitting abstracts for inclusion in the Summaries. Scales, 8.2 percent; tests, 7.3 percent; and inventories, 2.3 percent; were the primary appraisal instruments used. Sociometric techniques, .6 percent, and projective techniques, .2 percent were the least used appraisal instruments.

A total of 43, or 3.7 percent, of the studies reported that observation techniques were used to collect the data. Mechanical instruments, 1.4 percent; time sampling .9 percent; checklists and schedules, .2 percent; and behavioral diaries and anectdotal records, .2 percent comprised the specific observation techniques reported.

TABLE 6

NUMBER AND PERCENT OF DATA COLLECTION METHODS REPORTED IN AGRICULTURAL EDUCATION BY TYPE, 1974-1982

Data Collection Procedure Used	Studies Reported			
	Number		Percent	
Questionnaire	626		54.4	
-Direct Contact		5		.5
-Mailed		41		3.6
-Closed Form		18		1.5
-Open Form		4		.4
Interview	165		14.3	
-Individual		125		10.9
-Group		21		1.8
-Structured		2		.3
-Unstructured		1		.1
Appraisal Instrument	214		18.6	
-Test		84		7.3
-Inventory		27		2.3
-Scale		94		8.2
-Sociometric Technique		7		.6
-Projective Technique		2		.2
Observation	43		3.7	
-Checklists and Schedules		2		.2
-Time Sampling		10		.9
-Behavioral Diaries/Anectdotal Records		2		.2
-Mechanical Instruments		16		1.4
TOTAL	1,048		91.0	

The last objective of the study was to determine the extent to which various statistical analysis techniques or tests were used and reported. Data regarding whether or not statistical analysis techniques or tests were reported in the Summaries indicate that a total of 378, or 32.9 percent, of the studies reported the statistical test or technique used. In two-thirds of the cases, it was impossible to determine the statistical techniques or test used, by reading the abstract reported in the Summaries.

Data in Table 7 show the number of masters, doctoral and staff studies reporting the use of various statistical tests and techniques. A higher percentage of doctoral studies reported the use of statistical tests and techniques than did masters or staff studies. The statistics reported most often for masters studies were percentages, means, analysis of variance, t-tests and frequency distributions. The analysis of variance, means, percentages, chi square, and t-tests were reported most often in doctoral studies while precentages and the analysis of variance were most prevelant in staff studies. Other statistical tests or techniques reported in the research but not shown in Table 7 because of the small number of cases reported were: Duncan's Multiple Range Test, Fisher's LSD, The Gutman Scale, Kruskal-Walls Test, post-hoc tests, Q techniques, and Tukey's HSD test.

TABLE 7

NUMBER OF MASTERS, DOCTORAL AND STAFF STUDIES REPORTING THE USE OF VARIOUS STATISTICAL TESTS IN AGRICULTURAL EDUCATION RESEARCH, 1974-1982

Statistical Test or Technique Reported	Number of Studies Reported Masters	Doctoral	Staff
Frequency Distribution	22	22	12
Range	1	4	3
Mean	43	47	12
Percentage	99	46	42
Standard Deviation	7	5	0
Coefficient of Correlation	8	16	7
Pearson r	5	25	3
Kendalls tau	0	2	1
Rank Order Correlation	9	8	3
Point Visenal Correlation	0	1	0
Chi Square	19	44	8
Regression	2	8	3
Multiple Regression	4	10	1
t-Test	23	36	8
Analysis of Variance	31	68	16
Multiple Analysis of Variance	0	5	0
Factor Analysis	1	1	0
Discriminate Function Analysis	0	2	0

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

All conclusions and recommendations were based upon the results obtained in the study and can be held tenable only for the agricultural education research abstracts included in the Summaries of Research and Development Activities in Agricultural Education compiled and reported for the years 1974-1975 to 1981-1982.

1. Since 1974, when the studies were again reported on a national basis, the amount of research reported has almost tripled. The largest number of studies were reported during the 1979-1980 year with 181 studies being reported. Since that time, the numbers of studies reported has declined.

2. Masters studies reported composed 48.5 percent of the research reported while doctoral and staff studies made up 29.7 and 21.7 percent of the research reported respectively. One undergraduate honors thesis was also reported.

3. The central region reported the largest percentage of studies completed, 43.2 percent, followed by the southern region 25.7 percent, the eastern region 19.0 percent and the western region 11.8 percent.

4. A total of 50 of the 96 institutions having teacher education programs in agriculture reported research completed. Three institutions, the Ohio State University, Oklahoma State University and The Pennsylvania State University were conducting over one-third of the research reported. Over two-thirds of the research reported was being conducted by eleven of the 96 institutions included in the study. Forty-eight percent of the institutions did not report any research conducted.

5. Less than one percent of the research was reported as being funded research. The source of funding, if any, was not identified in the abstracts found in the Summaries.

6. Nine percent of the studies were classified as foreign studies by virtue of having data collected in countries other than the United States.

7. Descriptive studies comprised the majority of the research conducted in agricultural education as reported in the abstracts. Ninety percent of the studies reported were classified as descriptive, 9.3 percent were experimental and .7 percent were historical.

8. Descriptive masters studies were the most prevelant type of studies conducted. A total of 44.5 percent of descriptive masters level studies were reported. Of the total studies reported, 4.1 percent were experimental doctoral studies.

9. Of the descriptive research reported, 45 percent were classified as survey studies, 13 percent were interrelationship studies, and 4.4 percent were developmental studies.

10. The school survey was the predominant type of survey method used with 26.3 percent of the researchers using it. Job analysis and documentary analysis were used in 7.0 and 4.8 percent of the studies reported.

11. The causal comparative study was the predominate type of interrelationship study reported with 8.1 percent of the researchers reporting its use. Correlational techniques were used in 4.2 percent of the cases.

12. Developmental studies were reported infrequently in agricultural education research. Growth studies composed 3.5 percent of the studies reported while trend studies were conducted in one percent of the cases.

13. A total of 626, or 54.4 percent of the studies reported that questionnaires were used to collect data. Interviews were re-

ported as being used in 14.3 percent of the cases; appraisal instruments in 18.6 percent of the studies and observation was used 3.7 percent of the time.

14. About one-third of the studies submitted for inclusion in the Summaries reported the statistical test or technique used. In two-thirds of the abstracts of the studies reported, it was impossible to determine the statistical test or technique used.

15. A higher percentage of doctoral studies reported the use of statistical tests or techniques than did masters or staff studies.

RECOMMENDATIONS

1. Steps should be taken to encourage a larger number of institutions having teacher education programs in agriculture to conduct and report research findings in the Summaries. The data showed that 46 percent of such institutions had not reported any research during the eight year period studied.

2. A standardized checklist for reference when writing abstracts of studies completed should be developed. Results of the study indicated that essentials such as type of research, specific procedures used and type of statistical test or technique used were often not reported.

3. Exemplary abstracts of research should be identified or developed to upgrade the quality of abstracts submitted to the compiler and editor of the Summaries.

4. Agricultural educators should be aware of the small proportion of experimental and historical studies reported. The data collected showed that 90 percent of the agricultural education research reported was descriptive. Less than 10 percent of the studies were experimental and less than one percent were historical.

5. Researchers in agricultural education should continue to study the research and development efforts of the profession. Analysis of the research reported in the Summaries, 1974-1982, revealed a dearth of research on agricultural education research. If research and development are to lead the way, we must continually review and evaluate our efforts.

In summary, heretofore few studies have been conducted to analyze research methodology used in agricultural education. The current analysis of the abstracts reported in the Summaries provides data which is helpful in reviewing past practices and current research trends. The study conducted has empirically documented that descriptive studies dominate the research methodology used in agricultural education. The survey method and the use of questionnaires are the primary ways in which researchers collect data in agricultural education. The study serves as an important data base for research and development work in agricultural education and raises several issues which agricultural education researchers must address in the future.

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COMMUNITY DEVELOPMENT INSTRUCTION IN VOCATIONAL AGRICULTURE

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INTRODUCTION

Community development activities have been a part of the vocational agriculture program for a number of years. Under the major heading of "Community Service," vocational agriculture departments undertook projects that were aimed toward improving the community surrounding the school. In the 1970's, an incentive awards program, Building Our American Communities (BOAC), was initiated by the National FFA Organization to recognize accomplishments in community development. During the first years of the BOAC program, local FFA chapters continued to conduct service-oriented projects under the guise of community development.

Mere citizen participation, however, is not community development (Koneya, 1978). Community development is a process that involves citizens in identifying needs, setting goals, making decisions and initiating activities in accordance with their developed plan (Clouse & Cary, 1983). Service is one part of the total community development process.

The FFA organization has been known for its extensive incentive awards program. Awards are used to encourage students to learn and apply skills taught in the vocational agriculture classroom and laboratory. The awards system is tied closely to the instructional program. One exception has been the BOAC award program and community development instruction.

PURPOSE AND OBJECTIVES

The purpose of this project was to determine the current status of community development instruction in Ohio vocational agriculture programs. The following research questions were posed:

1. What community development topics should be taught as a part of instruction in vocational agriculture?
2. At what grade level should the topics be taught?
3. At what grade level are the topics currently taught?
4. How should community development topics be incorporated into the vocational agriculture curriculum?
5. How are community development topics currently incorporated into the vocational agriculture curriculum?

PROCEDURES

A random sample of 108 high school vocational agriculture instructors in Ohio was selected to participate in the study. A survey instrument was designed following the guidelines outlined in Dillman (1978). The instrument was mailed to the sample in May of 1983 with follow up reminders sent to increase response. Final response rate was slightly over 80%.

The instrument included two major sections. The first section addressed the current practices followed in teaching community development and perceptions regarding how community development topics should be taught. The 11 topics on the instrument were derived from the community development materials printed by FFA. The second section of the instrument was designed to collect demographic data regarding the program and participation in BOAC.

Information regarding question one of the study was obtained from responses on a Likert-type scale. Questions two and three included responses according to high school grade level. Questions four and five included responses to four predetermined categories. Data were coded and keypunched for analysis using the Statistical Package for the Social Sciences (Nie, et al., 1975).

RESULTS

Respondents indicated agreement that all 11 topics should be included in the vocational agriculture curriculum. On a six-point scale (6 = strongly agree to 1 = strongly disagree), mean scores ranged from 4.0 to 5.3 (see Table 1).

Regarding at what grade level the community development topics should be taught, a range of 74% to 90% indicated that each of the topics should be taught at the 9th, 10th, 11th or 12th grade level. Respondents tended to indicate generally that three of the 11 topics should be taught at the 9th grade level, seven at the 10th or 11th grade level and one at the 12th grade level (Table 2).

Respondents indicated that a range of 18% to 84% of the teachers actually teach each of the community development topics. For those topics being taught, respondents generally indicated that one topic is currently taught primarily at the 9th grade level, one topic is taught at a variety of grade levels and the remaining nine topics are taught primarily at the 11th and 12th grade levels (Table 3).

Respondents indicated that most community development topics should be taught as a part of leadership development. For eight of the topics, over 35% of the respondents indicated that the topic should be a part of a leadership development unit. For seven topics, respondents indicated the topic should be a part of an independent unit on community development. Only one topic was indicated that it should be taught as a part of units in technical agriculture (Table 4).

The current method of incorporating community development topics into the vocational agriculture curriculum differed from the earlier findings regarding how the topics should be included. Most topics are taught as a part of technical agriculture. Over 30% of the respondents indicated that eight of the topics are not taught (Table 5).

RECOMMENDATIONS

Several major implications arise from this study. First, there are differences in the way in which teachers incorporate community development topics into the vocational agriculture curriculum. Inservice activities should address those differences to be meaningful to teachers if increased teaching of community development instruction is the goal.

Secondly, community development instruction can and does occur at different grade levels. Materials and assistance should be provided to teachers for including community development instruction at a variety of grade levels.

Various techniques should be provided to teachers to aid them in incorporating community development topics into technical agriculture instruction and for teaching community development as an independent unit. And assistance should be provided to teachers who do not currently teach topics or perceive that community development topics should not be taught as a part of vocational agriculture.

The end result should be two-fold: (a) community development should be incorporated into the vocational agriculture curriculum as are other areas of instruction; and (b) the incentive awards program (BOAC) will change as an outgrowth of instruction rather than a detached award.

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Table 1

Whether Topics Relating to Community Development Should be Included in the Vo-Ag Curriculum

	Response												Non		
	SA		-		A		D		-		SD		Respond		
Topics	f	%	f	%	f	%	f	%	f	%	f	%	f	%	Mean
1. Definition of community	13	16.0	12	14.8	42	51.9	9	11.1	2	2.5	3	3.7	0	0.0	4.198
2. Definition of community development.	11	13.6	14	17.3	41	50.6	9	11.1	2	2.5	3	3.7	1	1.2	4.175
3. Importance of agriculture in community.	43	53.1	20	24.7	15	18.5	0	0.0	1	1.2	1	1.2	1	1.2	5.262
4. Identifying community needs and problems.	14	17.3	24	29.6	31	38.3	8	9.9	0	0.0	3	3.7	1	1.2	4.438
5. Gathering and analyzing data about problems.	7	8.6	18	22.2	36	44.4	14	17.3	1	1.2	5	6.2	0	0.0	4.012
6. Identifying influential people in community.	15	18.5	20	24.7	29	35.8	13	16.0	1	1.2	3	3.7	0	0.0	4.321
7. Identifying resources available in the community.	24	29.6	26	32.1	26	32.1	2	2.5	0	0.0	2	2.5	1	1.2	4.825
8. Exploring alternate solutions to problems.	12	14.8	24	29.6	38	46.9	3	3.7	2	2.5	2	2.5	0	0.0	4.432

					Response								Non		
	SA		-		A		D		-		SD		Respond		
Topics	f	%	f	%	f	%	f	%	f	%	f	%	f	%	Mean
9. Deciding upon solutions and planning programs.	10	12.3	22	27.2	32	39.5	10	12.3	2	2.5	2	2.5	3	3.7	4.282
10. Mobilizing resources and implementing solution.	11	13.6	19	23.5	30	3.70	11	13.6	3	3.7	3	3.7	4	4.9	4.195
11. Evaluating program effectiveness in the community.	12	14.8	23	28.4	29	35.8	7	8.6	4	4.9	3	3.7	3	3.7	4.295

Note. Scale:
6 = Strongly Agree
5 =
4 = Agree
3 = Disagree
2 =
1 = Strongly Disagree

Table 2

Grade Level That Topics Relating to Community Development Should be Taught

Topics	Should be Taught	Response[a]							
		Not Taught		9th	10th	11th	12th	No Response	
	%	f	%	f	f	f	f	f	%
1. Definition of community.	80.3	9	11.1	38	13	14	3	7	8.6
2. Definition of community development.	79.0	9	11.1	34	20	14	1	8	9.9
3. Importance of agriculture in the community.	90.1	2	2.5	52	14	16	10	6	7.4
4. Identifying community problems and needs.	79.0	9	11.1	23	24	10	13	8	9.9
5. Gathering and analyzing data about problems.	74.1	14	17.3	11	24	22	14	7	8.6
6. Identifying influential people in the community.	75.4	10	12.3	18	23	21	13	10	12.3
7. Identifying resources available in the community.	88.9	3	3.7	24	27	26	13	6	7.4
8. Exploring alternate ;solutions to problems.	87.6	5	6.2	19	27	31	21	5	6.2
9. Deciding upon solutions and planning programs.	79.0	8	9.9	11	25	31	18	9	11.1
10. Mobilizing resources and implementing solutions.	75.3	9	11.1	10	22	24	21	11	13.6
11. Evaluating program effectiveness in the community.	80.3	6	7.4	12	24	20	31	10	12.3

[a] Respondents could indicate more than one response; some did not respond.

Table 3

Grade Level That Topics Relating to Community Development Are Being Taught

Topics	Should be Taught	Response[a]							
		Not Taught		9th	10th	11th	12th	No Response	
	%	f	%	f	f	f	f	f	%
1. Definition of community.	64.2	24	29.6	22	6	21	10	5	6.2
2. Definition of community development.	55.6	30	37.0	19	7	18	7	6	7.4
3. Importance of agriculture in the community.	83.9	8	9.9	41	8	26	19	5	6.2
4. Identifying community problems and needs.	18.0	68	77.1	16	19	25	22	4	4.9
5. Gathering and analyzing data about problems.	50.6	34	42.0	4	9	23	13	6	7.4
6. Identifying influential people in the community.	60.5	26	32.1	11	12	21	16	6	7.4
7. Identifying resources available in the community.	79.0	12	14.8	17	15	26	20	5	6.2
8. Exploring alternate solutions to problems.	70.4	21	25.9	12	17	26	27	3	3.7
9. Deciding upon solutions and planning programs.	60.5	26	32.1	7	14	26	20	6	7.4
10. Mobilizing resources and implementing solutions.	56.8	27	33.3	6	13	24	19	8	9.9
11. Evaluating program effectiveness in the community.	58.0	26	32.1	7	13	22	25	8	9.9

[a] Respondents could indicate more than one response; some did not respond.

Table 4

How Topics Relating to Community Development Should be Taught

Topics	Independent Unit f	Independent Unit %	Leadership Development f	Leadership Development %	Technical Agriculture f	Technical Agriculture %	Not Taught f	Not Taught %	No Response f	No Response %
1. Definition of community.	24	29.6	33	40.7	12	14.8	12	14.8	0	0.0
2. Definition of community development.	19	23.5	38	46.9	11	13.6	11	13.6	2	2.5
3. Importance of agriculture in the community.	22	27.2	19	23.5	36	44.4	3	3.7	1	1.2
4. Identifying community problems and needs.	24	29.6	33	40.7	16	19.8	8	9.9	0	0.0
5. Gathering and analyzing data about problems.	20	24.7	22	27.2	24	29.6	14	17.3	1	1.2
6. Identifying influential people in the community.	16	19.8	33	40.7	15	18.5	15	18.5	2	2.5
7. Identifying resources available in the community	19	23.5	28	34.6	27	33.3	4	4.9	3	3.7
8. Exploring alternate solutions to problems.	24	29.6	26	32.1	21	25.9	9	11.1	1	1.2
9. Deciding upon solutions and planning programs.	21	25.9	30	37.0	17	21.0	11	13.6	2	2.5
10. Mobilizing resources and implementing solutions.	21	25.9	29	35.8	14	17.3	14	17.3	3	3.7
11. Evaluating program effectiveness in the community.	26	32.1	32	39.5	9	11.1	12	14.8	2	2.5

Table 5

How Topics Relating to Community Development Are Being Taught in the Vo-Ag Curriculum

Topics	Independent Unit		Leadership Development		Technical Agriculture		Not Taught		No Response	
	f	%	f	%	f	%	f	%	f	%
1. Definition of community.	13	16.0	27	33.3	12	14.8	24	29.6	5	6.2
2. Definition of community development.	11	13.6	28	34.6	11	13.6	26	32.1	5	6.2
3. Importance of agriculture in the community.	17	21.0	19	23.5	35	43.2	4	4.9	5	6.2
4. Identifying community problems and needs.	14	17.3	30	37.0	17	21.0	15	18.5	5	6.2
5. Gathering and analyzing data about problems.	10	12.3	19	23.5	16	19.8	30	37.0	6	7.4
6. Identifying influential people in the community.	11	13.6	25	30.9	14	17.3	25	30.9	6	7.4
7. Identifying resources available in the community.	14	17.3	24	29.6	27	33.3	11	13.6	5	5.2
8. Exploring alternate solutions to problems.	13	16.0	20	24.7	18	22.2	26	32.1	4	4.9
9. Deciding upon solutions and planning programs.	14	17.3	26	32.1	13	16.0	25	30.9	3	3.7
10. Mobilizing resources and implementing solutions.	10	12.3	26	32.1	10	12.3	30	37.0	5	6.2
11. Evaluating program effectiveness.	13	16.0	29	35.8	7	8.6	28	34.6	4	4.9